



The Secretary of Energy  
Washington, DC 20585  
May 18, 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. 20004-2901

Dear Mr. Chairman:

Thank you for your letter transmitting the Defense Nuclear Facilities Safety Board's Recommendation 2001-1. The Department welcomes the Board's input on this subject and accepts Recommendation 2001-1 as addressed in the enclosed implementation plan. The plan provides detailed discussion and specific milestones for each of the sections of the recommendation.

In summary, the Department is firmly committed to the safe and efficient operation of the high-level liquid waste management facilities at the Savannah River Site. The Department believes that the Implementation Plan will maintain an adequate margin of safety for the protection of human health and the environment. As ongoing reviews of the high-level waste system plan and system performance identify opportunities for improvement, such improvements have been, and will continue to be, incorporated. As stated in your letter, some of the actions encompassed in the Recommendation have been already implemented or are being pursued by the Department.

I have designated Mr. Mark Frei, Deputy Assistant Secretary for Project Completion, Office of Environmental Management, as the responsible manager for implementing the Department's response to this Recommendation. Mr. Charles E. Anderson, Assistant Manager for High Level Waste, Savannah River Operations Office, will be the point of contact for the site-specific actions for this Recommendation. Mr. Frei may be reached at (202) 586-0370 and Mr. Anderson can be reached at (803) 208-6072.

Sincerely,

Spencer Abraham

Enclosure



## CURRENT STATUS OF HIGH LEVEL WASTE SYSTEM RELATIVE TO DNFSB RECOMMENDATION 2001-1

### General:

The Department shares the Board's concern about reliance on older equipment for long-term operations. The Department, however, believes that due attention is being afforded these areas. Furthermore, the Department believes that, because an adequate safety margin is in place, it is more prudent to pursue activities that result in waste stabilization than to focus on activities that may improve short-term storage conditions while delaying ultimate stabilization. The Department believes careful consideration was given to the technical safety issues and the risks and benefits were properly balanced prior to the re-use of old style tanks.

While the Department shares the Board's concerns about the decreasing operational flexibility in the Tank Farms due to increasing material backlogs as a result of equipment and process problems, the Department does not agree that the margin of safety has been reduced by recent events and actions. Authorization Basis and environmental regulatory requirements have all been met without using reserve storage space.

Finally, the Department recognizes and shares the Board's desire to move forward expeditiously with efforts toward long-term solutions. The Department is committed to ensuring the best solutions are chosen after careful identification and consideration of safety and programmatic risks. As the Board is aware, the early identification and resolution of technical issues significantly reduces project delays, redesign, and compensatory measures during the construction and operational phases of a project. As discussed below in response to the specific subrecommendation related to salt disposition, progress in this area is being made on schedule, and the time spent resolving issues is proving worthwhile.

In summary, the Department is aware of the loss of operational flexibility currently being experienced in the Tank Farms as a result of process and equipment failures. The Department and its contractors are committed to restoring operational flexibility in a safe and timely manner. In developing this implementation plan all actions are assumed to be fully funded.

### Specific Recommended Actions:

#### ***1. Initiate actions to remove transferable HLW liquid from Tank 6 to a level below all known leak sites.***

The Department accepts this subrecommendation. An initial transfer of 40,000 gallons of liquid from Tank 6 into Tank 8 was completed on March 27, 2001. As committed to in our video conference call with the Board on March 22, 2001, the Department has continued to evaluate the Tank 6 condition and the overall HLW system. Based on our evaluation the Department has concluded that additional lowering of the waste in the tank to below the lowest known leak site is appropriate and this direction was given to the site contractor on May 1, 2001.

DOE recognizes that situations compromising the integrity of the primary containment are undesirable. The Department has determined that the Tank 6 waste can be lowered below the lowest known leak site without significantly compromising the primary mission objective of HLW retrieval and vitrification. This will allow a reduction in Tank 6 surveillance activities related to the status of identified leak sites.

The Department implementation milestone for this subrecommendation is:

Commitment 1.1	Pump tank to below the lowest known leak site.
Lead Responsibility:	Deputy Assistant Secretary, Office of Project Completion
Due Date:	May 31, 2001

**2. *Reassess the schedule and priority for selecting a technology for a salt processing capability, and vigorously accelerate the schedule leading to operation of a salt processing facility.***

The Department accepts this subrecommendation and will assess the schedule for salt processing once the preferred technology decision is made and will accelerate this critical activity where possible. The Department will then provide a briefing to the Board.

The selection of a salt processing technology is a critical priority of the Department and the process remains on schedule for a July 2001 decision date. Radioactive waste test demonstrations currently in progress are a key element of the selection process. Acceleration of this date at this time is not considered feasible. Since March 2000, the Department has been working towards identify a preferred technology in June in accordance with the Action Plan defining the Savannah River Site Salt Processing Project Roles and Responsibilities. Under this Plan, a joint Headquarters/Savannah River Site Technical Working Group (TWG) was established to lead the effort for technology selection. Key activities selection include the development of selection criteria and conduct of extensive research and development testing that will address high technical risks for each of the technologies under consideration. These activities have been completed or they are on schedule to identifying a preferred technology in June. The Salt Processing Alternatives Draft Supplemental Environmental Impact Statement (SEIS) has been issued for public comment and the final SEIS is on schedule to support the decision-making process. The Department currently plans to have the Record of Decision for this SEIS embody the DOE selection, with issuance by July 2001. Once this decision is made, the Request for Proposals (RFP) will be issued to seek up to two Engineering, Procurement, and Construction (EPC) contractors to perform conceptual design of the full-scale facility.

Planning for the Salt Waste Processing Facility (SWPF) includes a pilot plant for the technology selected. A pilot plant is viewed as critical to further mitigate technical risks prior to final design and construction of the SWPF and will improve confidence in project execution. To this end, pilot-plant design, construction, and operation are being planned to provide meaningful input to the conceptual and preliminary design.

Efforts are being made to ensure that the decision date will be met and that follow-on design, construction and startup activities can begin on schedule. It should be noted that part of the overall strategy for this effort is one of continually identifying and implementing actions to ensure that an effective salt-processing technology is selected and constructed on or ahead of schedule. This project is managed in accordance with DOE Order 413.3 and has incorporated "lessons learned" from other projects.

The Department is committed to ensuring that the best technology is chosen after careful identification and consideration of safety and programmatic risks. Given the long-term nature of this program, and consistent with DOE Order 413.3, the Department believes that the establishment of program/project milestones beyond technology selection is counterproductive until a firm baseline is established (35% design completion). However, DOE commits to continue to assess the schedule in an effort to accelerate this critical activity, and therefore accepts this subrecommendation.

The Department implementation milestone for this subrecommendation is:

Commitment 2.1:            Make a preferred technology selection and issue ROD.  
Lead Responsibility:        Deputy Assistant Secretary, Office of Project Completion  
Due Date:                    July 2001

Commitment 2.2:            Brief the Board on the preferred salt processing technology selection, schedule, and opportunities for acceleration.  
Lead Responsibility:        Deputy Assistant Secretary, Office of Project Completion  
Due Date:                    July 2001

**3. *Develop and implement an integrated plan for HLW tank space management that emphasizes continued safe operation of the Tank Farms throughout its life cycle. This plan should include enough margin to accommodate contingencies and reduce overall programmatic risk. The plan should also restore operating margin to the Tank Farms by including action to:***

The Department accepts this subrecommendation and the HLW System Plan update will be provided to the Board. The Tank Farm space management strategy is based on a set of key assumptions involving canister production rates, influent stream volumes, Tank Farm evaporator performance, and space gain initiative implementation. Tank space management is a sub-set of the overall integrated HLW System Plan and as such is a life-cycle look at the space available to accommodate contingencies and support site missions. The HLW System Plan is updated annually and considers the latest data available as well as the current conditions, challenges and potential impacts to Tank Farm operations. The next revision to the HLW System Plan, scheduled for issue in May 2001, will provide enhanced coverage of areas not previously highlighted and will include management of Type I, II, and Type IV tanks.

Each of the specific actions in the Board's Recommendation is addressed below.

**a. *reduce or eliminate the DWPF recycle stream***

Several proposals already have been made to reduce the volume of DWPF recycle waste sent to the Tank Farm. A major reduction effort was implemented in January 2000 to isolate the steam atomized scrubber system from the melter off-gas system. This resulted in an annual 700,000-gallon reduction in recycle being sent to the Tank Farm. Proposals associated with the frit transfer system and reductions in sample line flushes resulted in additional water generation reductions. It is anticipated that the annual recycle being sent to the Tank Farm will be reduced from approximately 2,200,000 gallons for a 250 can-per-year production rate to approximately 1,400,000 gallons or less. Additional DWPF recycle reduction proposals, such as the installation of a DWPF acid evaporator, will be evaluated.

**b. *recover former ITP tanks for Tank Farm operations***

A schedule has been implemented to return Tank 49 (previously an ITP salt processing tank) to waste concentrate storage. A briefing for the Board on August 2, 2000, provided the Department's plans relative to Tank 49. Tank 49 currently contains approximately 200,000 gallons of benzene-bearing solution from ITP demonstration runs that must be removed prior to its return to waste storage service. The decomposition of benzene producing phenylborate compounds will be performed in two phases. The first phase was completed in March 2001 when the material in Tank 49 was heated to 40 degrees Celsius. The second phase involves the introduction of copper catalyst to Tank 49. The first copper addition occurred in March 2001 and subsequent additions are scheduled to be completed by May 2001. Once the decomposition of the phenylborates is complete, the material in Tank 49 will be transferred to Tank 50. Modifications required to tie Tank 49 into the H-Tank Farm transfer system already have been completed. Tank 49 is expected to be available to receive concentrated waste later this year.

Tank 50, currently being used as a receipt tank for Effluent Treatment Facility (ETF) bottoms, is scheduled for return to waste concentrate storage in late 2002. The associated construction/project work has been initiated to support this effort. A Baseline Change Package authorizing the start of this work was approved April 23, 2001.

Additionally, Tank 48, which already is addressed in the Recommendation 96-1 Implementation Plan, is an option and will be considered for future revisions of the HLW System Plan. Lessons learned from returning Tank 49 to service will be incorporated into the future Tank 48 plans and factored into future revisions of the HLW System Plan.

**c. *assess the desirability of adding an additional HLW evaporator to support Tank Farm operations***

Construction of an additional evaporator is not a viable alternative for the near-term. The current issues impacting evaporator operations are not associated with evaporator capacity. The current issues are process and equipment related which, would also exist

with a new evaporator system. These problems are specifically addressed in paragraph (e) below. The Department considers that a more prudent and cost-effective approach to resolve the problem is by optimizing existing evaporator operations by means of resolving waste compatibility and equipment degradation problems.

Previous studies have shown that the three evaporator systems currently available have sufficient capacity to handle the expected demands of the HLW system once the process and equipment issues associated with the 2H and 3H Evaporator systems are overcome. These studies also show that the three evaporator systems operating at planned capacity will provide margin to accommodate future system upsets and allow the option to shutdown the 2F Evaporator system at some point in the future. The 2F Evaporator system could potentially be used as a "contingency" when this margin is achieved.

The Department concludes that a new evaporator is not a feasible near-term solution, and it projects that an excess evaporation capacity will exist in the long-term.

***d. assess the feasibility of constructing new HLW tanks***

Previous consideration of this option indicates that it is a costly approach that has many regulatory, stakeholder, and permitting issues. In addition, constructing and operating new HLW tanks would add to the ultimate environmental management and restoration cleanup mission. This option is not considered feasible as a short-term remedy to gain operating safety margin in the Tank Farms. It has been estimated that the permitting and construction period required to have tanks suitable for storage of HLW would take from seven to ten years.

The Department concludes that new HLW storage tanks are not a near-term solution, but it will evaluate them as a longer-term solution if salt processing capability is not achieved as planned.

***e. resolve waste compatibility and equipment degradation problems to allow unconstrained operation of the three existing evaporators***

Improvements made to the 2F Evaporator system during FY 2000 have made that system more reliable and current performance is better than expected. This system is operational and a new vessel is currently on hand should it be necessary to replace the existing vessel.

The 2H Evaporator experienced erratic lift rates and was shut down in January 2000 when attempts to correct the lift rate were unsuccessful. Sample results from solids previously found in the evaporator pot revealed that the material consisted of sodium aluminosilicate and sodium diuranate. Initial analysis indicated that these solids form in the presence of high silica and high aluminum feed. The Savannah River Technology Center (SRTC) continues to analyze methods of preventing the aluminosilicate formation in the evaporator pot. Until this work is completed, appropriate controls have been put in place to limit the amount of silica content in the feed to the 3H and 2F Evaporators.

Operations are now underway to the 2H Evaporator to remove the solids. The 2H Evaporator cleaning and recovery efforts are behind schedule but this system is expected back into operations in FY 2001.

The 3H Evaporator system is operating in a limited mode due to cooling coil problems in Tank 30 (the 3H Evaporator drop tank). A project to convert Tank 37 to drop tank service, by installing a drop line from the evaporator to the tank, has been initiated and the Baseline Change Proposal (BCP) authorizing funding was approved on April 23, 2001. The schedule to have the 3H system functioning at full capacity is late 2002.

The revised HLW System Plan accounts for these difficulties and the resolutions described above are underway.

The Department implementation milestone for this subrecommendation is:

Commitment 3.1:	Issue Revision 12 of the HLW System Plan.
Lead Responsibility:	Deputy Assistant Secretary, Office of Project Completion
Due Date:	May 2001

**4. *Reassess contractor incentives to ensure that near-term production at DWPF is not overemphasized at the expense of safety margin in the Tank Farms***

The DOE accepts this subrecommendation. The Department has re-assessed the contractor incentive package to identify whether additional incentives are needed to promote near term improvements in Tank Farm operations.

The current incentive package is based upon significant amounts of fee at risk if the safety and long-term reliability of the system is allowed to deteriorate in order to meet short term DWPF production. In trying to minimize the potential that the contractor would pursue short-term gain at the expense of longer-term system reliability, several features were incorporated into the final set of incentives currently being used:

1. The number of canisters produced in the later years of the contract period earn larger fees than those produced earlier. This feature was incorporated to ensure that work on the preparation of sludge batch 3 was maintained and that this batch of feed would be ready to support the overall canister production goals.
2. Specific evaporation and tank farm space goals were allotted separate incentives to ensure that the tank farm health at the end of the period was sufficient to support continued operations after the contract period.
3. Separate incentives were identified for specific safety documentation goals.
4. Minimum levels of performance were established. Failure to attain these levels could result in application of the Conditional Payment of Fee clause. Under this clause significant reductions in previously earned fees could result from a failure to meet the minimum levels of performance specified.

5. Unallocated fee was set aside for emergent activities/situations that may warrant incentivization. This is a continually ongoing process and will be the basis for the Department's current re-assessment.

The Department plans to assess the appropriateness of these incentives annually throughout the term of the existing contract.

Commitment 4.1: The Department will provide a briefing to the Board on specific elements of the current incentive package at Savannah River Site.  
Lead Responsibility: Deputy Assistant Secretary, Office of Project Completion  
Due Date: July 2001