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The Under Secretary of Energy
Washington, DC 20585

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DNF SAFETY BOARD

August 31, 1998

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

Dear Mr. Chairman:

Thank you for your March 18, 1998, letter forwarding the Defense Nuclear Facilities Safety Board Staff Issue Report, "Spent Nuclear Fuel Project Review at the Hanford Site." The enclosure to this letter provides the Department of Energy's (DOE) responses to the issues raised in that report.

Your letter noted that, "Reduction of unnecessary conservatism in design and analysis should be considered when possible to enhance schedule performance and reduce costs." The Department agrees with that observation and is working to remove any unnecessary conservative aspects of the Hanford Spent Nuclear Fuel (SNF) Project. The degree of conservatism has been commensurate with the uncertainty of spent fuel characterization, and the maturity of facility design and safety analyses. Some examples of reduced conservatism that has already been achieved are the deletion of inerting the storage tubes and the Multi-Canister Overpack (MCO) Handling Machine and the deletion of the Hot Conditioning System.

You also noted that "prompt attention to resolution of emerging technical issues based on a balance of needs will contribute to the safe expeditious initiation of fuel removal." The Department continues to focus attention on technical issue resolution as a major factor in project success. The Department's assessments throughout the past year have highlighted this concern, and the contractor has responded with a focus on resolving open technical issues. The Fluor Daniel Hanford (FDH) has identified major technical concerns and incorporated their resolution into the project schedule baseline.

In addition, these issues are being followed by contractor and the DOE Richland Operations Office senior management at weekly meetings to ensure schedule commitments are met. It is evident to the Department that the contractor senior management team understands the importance of closing technical issues. The major technical issues remaining include those that might impact on the project safety basis. They include final determination of uranium reaction rates, the

number of scrap baskets allowed in a MCO, final determination of the amount of aluminum hydroxide on K-West SNF, and final determination of the SNF monitoring program once placed in storage. Richland considers that all of these issues are sufficiently on track to pose a low risk to project success. The FDH has pursued them all aggressively and only minor delays are being incurred.

The Department is also conducting a joint detailed review of the SNF Project cost and schedule baseline to ensure that the project is being managed in sufficient detail to ensure commitment dates are meaningful and have high probability for being achieved. Your staff has been able to participate in this review, and we are pleased to note that opportunities for future improvement in project execution are apparent. The Department has identified no high risks that jeopardize the current contractor schedule for this project and expects to validate the cost and schedule baseline by November 1998. We will continue to advise your staff of progress being achieved to improve project management performance.

The Department appreciates the Board's interest in the Hanford SNF Project. If you have any further questions, please contact me or have a member of your staff contact Mr. Brad Nelson, Office of Environmental Management, at (301) 903-4393.

Sincerely,

A handwritten signature in black ink, appearing to read "Ernest J. Moniz". The signature is written in a cursive style with a large, stylized "M".

Ernest J. Moniz

Enclosure

cc: Mark Whitaker, S-3.1

Responses to DNFSB Staff Observations During a February 3-5, 1998 Visit to the Hanford Spent Nuclear Fuel Project

Observation 1: Schedule Recovery for Initiation of Fuel Removal

1A: There is a lack of emphasis on initiating fuel movement as soon as possible. The guidance contained in the DNFSB Recommendation 95-2 to tailor requirements offers the potential for schedule recovery.

Response 1A: DOE agrees with the need to emphasize the earliest possible date for spent fuel movement. We also agree with the observation that the integrated safety management approach will be instrumental in identifying the appropriate Hanford SNF Project requirements and safely moving the spent fuel as soon as possible.

DOE is committed to implementation of the Integrated Safety Management System (ISMS) on this project and has performed a Phase I Verification at the K-Basins. DOE will also be conducting a contract incentives review that will identify how incentives are being used to meet or accelerate the project schedule. The incentives review will be completed this fall.

1B: The proliferation of individuals who manage and coordinate the safety review effort could interfere with effective and timely preparation of the required safety documentation.

Response 1B: DOE is also concerned about interference with effective and timely preparation of safety documentation, and is monitoring these activities to ensure that the personnel additions achieve the purposes intended by the DNFSB and DOE. In the DNFSB TECH-17 report, the DNFSB staff indicates that, "the technical competence of the safety analysis staff (Safety Analysis Report [SAR] preparers) should be improved by augmenting the staff with experienced personnel," and "that without compromising independence, workplace participation by RL personnel could reduce the frequency of SAR comments and the time required to develop RL comments on SARs, as well as minimize the time required to prepare Safety Evaluation Reports and approvals. If safety reviewers from RL were to have a greater presence during the design effort, significant improvement in SAR quality and review effort could be obtained." DOE and contractor review of DNFSB TECH-17 resulted in agreement with the DNFSB TECH-17 observations. Actions were subsequently taken by Fluor Daniel Hanford (FDH) and Duke Engineering & Services Hanford (DESH) to augment the staff preparing the SARs with experienced personnel, and to increase management oversight of SAR preparation. One person has been assigned within FDH to be the lead interface with DOE Richland (RL) on SARs.

It should be noted that some organizational changes have been made since the DNFSB staff's visit. The Fluor Daniel/Duke team now reports directly to the Fluor Daniel Hanford president reducing the number of reporting levels. In order to increase integration between engineering and safety analysis, DESH also has organized the SAR preparation staff so that it reports to the chief engineer. DOE and its contractors are continuing to seek ways to best serve the interests of the project.

RL has also taken action to initiate earlier oversight of the safety analysis preparation effort by DESH and FDH. This early oversight effort will help keep DOE fully aware of SAR development, and will assist in resolving fundamental conceptual issues. This early interaction will also afford DOE the opportunity to commence research on potential issues in preparation for review of the SAR. Additional RL staff resource was provided to assist in this effort, but the purpose was not to coordinate the review team responses.

DOE is convinced that these actions by RL, FDH, and DESH are consistent with the DNFSB TECH-17 observations. RL will monitor performance to ensure that there is no interference with the effective and timely preparation of SAR documentation, and will make any warranted adjustments.

Observation 2: Sealing of MCO After Cold Vacuum Drying (CVD)

Refinements to the sealing strategy model(s) based on additional characterization would not add much to the current calculations without causing significant delays to the SNF Project schedule. Monitoring of the MCOs as they age with a statistically based sampling program for the remaining 376 MCOs will be required to validate refined calculations/assumptions.

Response 2: The Department agrees that refinements based on additional characterization could cause significant delays to the schedule. The characterization program has been reviewed against data requirements needed to close remaining technical issues. All remaining "whole-element" furnace tests have been de-scoped. In-basin measurement of aluminum hydroxide coatings supporting MCO sealing, and a final set of small sample oxidation tests in a moist environment supporting the safety case for CVD, are the last two N-Reactor spent fuel characterization tasks. Both will be completed within approximately three months.

Although the current intent is that no safety issues will require MCO gas pressure and composition monitoring, DOE agrees with the DNFSB staff observation that some monitoring plan is prudent in confirming the composite of assumptions used in analysis. DESH is developing a monitoring plan, which is scheduled for completion by the end of September 1998.

Observation 3: Aluminum Hydroxide

The availability and weldability of higher-strength material (for the threaded extension of the MCO shell) to implement this change (increasing design pressure) are potential concerns. The existing 150 psig design is estimated to be capable of meeting a design pressure of 260 psig, which is equal to the estimated pressure that could be developed with no aluminum hydroxide removal.

Response 3: Based on current understandings, raising the MCO design pressure from 150 psig to 450 psig will account for all credible pressurization mechanisms without radical changes to other processes, such as aluminum hydroxide coating removal. The upgraded MCO requires an improved-strength stainless steel, XM-19, to meet pressure requirements. Weldability and availability of XM-19 have been thoroughly reviewed by DESH, and DESH has concluded that those are not issues that require further action. DESH is, however, reviewing the strengthened MCO design, and if the 450 psig requirement can be met using 304L stainless steel, the XM-19 material will be eliminated from the design at a significant cost avoidance. The material evaluation effort should be completed within a few months, well before the MCO procurement actions tentatively scheduled for October 1999.

Observation 4: Welded Cap on the MCO

The lack of provision for cutting the weld and removing the cap at a later time is of concern. This is a NRC requirement (10CFR72.1221)

Response 4: Weld cutting and cap removal is a relatively common and well understood process. DOE believes that this operation is not precluded by current plans. Recent changes in the MCO design to accommodate ultrasonic testing of the closure weld provide adequate clearance for welding, examination, and cutting and rewelding, if necessary.

Observation 5: Runaway Reactions in Water-Filled MCO's

The staff has suggested that the process (heat MCO to 50°C before removing water) be revised to remove the water before the MCO is heated to 50°C.

Response 5: Lowering the temperature at which the water is drained from the MCO before heatup for cold vacuum drying (CVD) has been suggested during the safety reviews as a means of providing additional margin against oxidation reactions. This draining temperature adjustment has not yet been fully evaluated, but there could be impacts on cycle time and complications in the process if effective heating is not provided after draining of the water. DOE will inform the DNFSB staff of the results of the evaluation, within a few months when completed. This is not projected to be in the critical path.