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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 22, 1998

The Honorable Ernest J. Moniz  
Under Secretary of Energy  
Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585-1000

Dear Dr. Moniz:

The Defense Nuclear Facilities Safety Board (Board) has reviewed the Department of Energy's (DOE) System Requirements Document (SRD) for Board Recommendation 97-1, *Safe Storage of Uranium-233*, dated May 1998, which was submitted with your letter dated June 5, 1998.

It is clear that DOE's Recommendation 97-1 technical team has made a strong and commendable effort to identify appropriate requirements for the U-233 storage program. As the technical team has recognized, the present state of uncertainty regarding a number of issues has resulted in many instances in which it was necessary to defer specifying requirements until additional information can be obtained. These issues include (1) characterization of the material, (2) potential future beneficial uses of the material, (3) possible designation of portions of the material as waste meeting Waste Acceptance Criteria, (4) final acceptable storage form(s) of the material, (5) identification of the site(s) at which the material is to be stored, and (6) final material disposition paths. Because of these uncertainties, it is imperative that the Project Execution Plan (PEP) address the open issues in the SRD comprehensively, and that it provide a well-defined basis for moving forward with the program to safely characterize, stabilize, and store these materials.

Through the interaction of its staff with DOE's technical team, the Board is aware of DOE's planned emphasis on timely resolution of these programmatic uncertainties, including the establishment of firm dates for crucial policy and programmatic decisions by senior DOE managers, as well as the prompt development of the PEP and a formal Systems Engineering Management Plan (SEMP). The Board concurs with this approach and looks forward to reviewing the SEMP this fall.

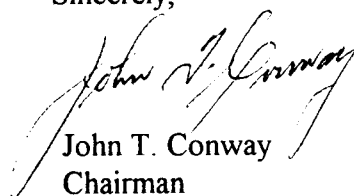
The Board's staff has encouraged the 97-1 technical team to articulate planning assumptions as a means of calling attention to the required management decisions in the above areas, while proceeding with the effort needed to address the most pressing storage issues. Resolution of these issues will require that senior DOE managers make key decisions expeditiously.

The Board strongly encourages DOE to continue development of a sound U-233 safe storage standard and to complete near-term activities regarding characterization and final site assessments. We also encourage you to continue to take a strong personal lead on these issues to ensure that technical issues are resolved in a manner that addresses the safety concerns raised by 97-1 and that issue resolution is not hindered by other (e.g., budgetary) constraints. In the meantime, the 97-1 Implementation Plan commitment to provide a complete SRD remains open until further progress has been made on the systems engineering effort.

There are some significant omissions from the SRD involving matters that more properly need to be addressed in the pending revision of DOE-SAFT-0067, *Criteria for Preparing and Packaging Uranium-233 Bearing Metals and Oxides for Long-Term Safe Storage*, as discussed in the Board's letter of June 10, 1998.

For your assistance, I am enclosing a Board staff issue paper that discusses these matters in more detail.

Sincerely,



John T. Conway  
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Staff Issue Report

July 20, 1998

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
**COPIES:** Board Members  
**FROM:** H. W. Massie  
**SUBJECT:** Recommendation 97-1 Issues

This report documents issues related to the Department of Energy's (DOE) effort to implement Defense Nuclear Facilities Safety Board (Board) Recommendation 97-1, *Safe Storage of Uranium-233*. The Board's staff has reviewed the System Requirements Document (SRD) transmitted to the Board by a letter from EM-1 dated June 5, 1998. Although the SRD is appropriately comprehensive in identifying requirements for the safe storage of U-233, the present state of uncertainty associated with the potential future disposition of U-233 has resulted in a large number of important system requirements being designated as "to be determined (TBD)."

At a DOE 97-1 Technical Team meeting held June 23–24, 1998, in Idaho Falls, the Technical Team took the position that engineering trade studies needed to complete the Project Execution Plan (PEP) cannot be identified until several policy decisions and programmatic issues have been resolved. Members of the Board's staff attending that meeting suggested that the team find a means to highlight the pressing need for timely management decisions regarding those policies and programmatic issues, while proceeding with the effort based on reasonable planning assumptions yet to be articulated (see below). It is vital to successful 97-1 implementation that the PEP address potential future disposition of U-233, as well as policy and programmatic issues that affect the project's timely execution.

**Systems Engineering Development.** The DOE 97-1 Technical Team held a vigorous discussion regarding the path forward for the systems engineering portion of the 97-1 Implementation Plan (IP). As a result of its efforts to complete the SRD, the DOE 97-1 Technical Team now realizes that major programmatic issues, such as the following, urgently need to be addressed:

- What is DOE's long-term strategy for a path forward for U-233, along with other fissile materials (i.e., in the Nuclear Materials Integration Study under John Tseng)?
- What portion of U-233, if any, should be kept for possible medical use?
- What does "interim" storage mean versus long-term storage?

- How does the work being conducted under the Nuclear Materials Integration Study affect safe storage of U-233 ?

Leadership of the 97-1 Technical Team proposes to arrange a joint DOE meeting among DOE personnel working on Nuclear Materials Integration, 94-1, and 97-1, along with representatives of the Office of Fissile Materials Disposition, to discuss establishing a Department-wide policy for path(s) forward for the U-233 materials.

The Board's staff proposed that the DOE 97-1 Technical Team develop a list of "planning assumptions" to allow the work to move forward and to serve as a basis for the proposed joint meeting. The team generated the following initial planning assumptions for the U-233 safe storage program:

- Some U-233 will be transferred directly to the Office of Fissile Materials Disposition, some will be retained over the long term for medical or other programmatic use, and some will be disposed of as waste. Thus, provisions must be made for all three activities in the PEP.
- Material determined to meet the lower waste threshold criterion is beyond the scope of the 97-1 program and the PEP (i.e., the exception material that is in the middle category of the waste threshold criteria, including most of the Idaho National Engineering and Environmental Laboratory [INEEL] material stored in the tube vaults, is within the program scope).
- The material will be consolidated at no more than two DOE sites (i.e., INEEL and Oak Ridge National Laboratory [ORNL]). Thus, provisions for safe transport of at least some of the material must be included in the PEP.

The DOE 97-1 Technical Team will complete a more detailed list of planning assumptions that will allow them to select trade studies needed to complete the Project Execution Plan (PEP) (scheduled for delivery to the Board in December 1998). The Board's staff noted that many of the planning assumptions entail both schedule and programmatic risks and therefore must be managed carefully. These risks and their potential impact on the 97-1 project needs to be described in the PEP, along with a description of how these risks will be managed.

The team believes it is premature to proceed with a System Design Description (SDD) (due for delivery to the Board by October 1998) because of the uncertainties noted. The Board's staff concurs with the proposal to delay development of the SDD until later, perhaps about mid-1999.

The DOE 97-1 Technical Team decided to prepare a Systems Engineering Management Plan (SEMP) (not presently identified in the IP as a deliverable) by October 1998. The staff

concur with the need to issue a SEMP, even though it is not identified in the IP, and agrees that delivery this fall is appropriate.

The above changes will require a change to the 97-1 IP. The DOE 97-1 Technical Team Chairman intends to discuss this issue with John Tseng and S-3.1 and to address these issues with the Board.

The Board's staff believes many of the above issues must be addressed in the development of the PEP, which needs to integrate all aspects of the U-233 Safe Storage Program, including how DOE intends to manage schedule and programmatic risks. Milestones for key decisions addressing these risks ought to be included in the PEP schedule. The attachment to this report provides examples of other matters that need to be included in the PEP. These matters have been discussed with the DOE Technical Team.

**Funding Concerns.** FY 1999 and 2000 funding for Recommendation 97-1 appears bleak. No budget exists for ORNL in the FY 2000 budget, and there is a shortfall in the FY 1999 DP budget. INEEL has the tightest situation, with potential congressionally mandated FY 1999 cuts in EM funding. This area requires action by DOE headquarters.

**Next Technical Team Meeting.** The teams's next meeting will be held at Oak Ridge on August 11-12, 1998.

**Future Staff Actions.** The Board's staff will attend the Technical Team meeting in August, and will continue to follow FY 1999 and 2000 funding for 97-1. The staff will also review DOE's plans for modifying the IP for systems engineering work, including a more robust PEP that reflects a comprehensive, complex-wide systems approach.

**Attachment**  
**Example Items for Inclusion in the 97-1 Project Execution Plan (PEP)**

- Organizational structure that meets the Board's acceptance letter of October 21, 1997. How should the project be organized?
- Impact of possible transfer of programmatic responsibility for ORNL Building 3019 from DP to EM.
- Clear identification of programmatic risks and risk management approaches, as a means to encourage timely policy decisions (e.g., materials disposition) and completion of trade studies.
- Identification of key decision points and schedules, including milestones from the National Environmental Policy Act (NEPA) process, while necessary work activities are expeditiously implemented (e.g., conceptual system design and procurement of long-lead items).
- Plans for addressing legislative issues (e.g., U-233 in the Waste Isolation Pilot Plant).
- Final resolution of approaches for maintaining technical competency (Subrecommendation 8).
- Interim technical baseline.
- Plans for near-term work, such as results of final site assessments and material inspection plans and schedules.
- Plans for updating the U-233 database described in the draft U-233 storage standard.
- Results of the study of alternatives to ORNL Building 3019 as an interim storage facility.
- Results of any other trade studies needed to complete the PEP.
- Multiyear schedules and budgets.
- Systems Engineering Management Plan