



Department of Energy
Washington, DC 20585

QA: N/A

August 21, 2006

AUG 25 2006

B. John Garrick, Ph.D.
Chairman
Nuclear Waste Technical Review Board
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201-3367

Dear Dr. Garrick: *John*

Thank you for your June 14, 2006, letter providing the Nuclear Waste Technical Review Board's (Board) comments on the information presented by the U.S. Department of Energy at the Board's meeting on May 9, 2006. Our response to the Board's letter is enclosed.

We appreciate the opportunity to inform the Board of the progress of the Civilian Radioactive Waste Management Program. The Department continues to benefit from the constructive views of the Board, and we look forward to further dialog on the repository and related issues.

Sincerely,

A handwritten signature in cursive script, appearing to read "Edward".

Edward F. Sproat, III, Director
Office of Civilian Radioactive
Waste Management

Enclosure



**U.S. DEPARTMENT OF ENERGY RESPONSES TO THE
JUNE 14, 2006, LETTER FROM THE
NUCLEAR WASTE TECHNICAL REVIEW BOARD**

Development and Deployment of Transport, Aging, and Disposal Canister Systems

The Department agrees with the Board's view that the early availability and implementation of transport, aging and disposal canister (TAD)-based systems for additional at-reactor storage of spent nuclear fuel are important to ensure that the benefits of the TAD system are realized at the Yucca Mountain facilities. The Department is considering incentives to ensure that the cask vendor community develops TAD-based systems in a timely fashion, as well as incentives to encourage early deployment of these systems at utility sites.

In developing these concepts to encourage the early development and deployment of TAD-based systems, the Department recognizes that, until the conclusion of the Nuclear Regulatory Commission licensing proceedings for Yucca Mountain, there will be some risk that TAD systems developed in accordance with the Department's performance specifications may not ultimately prove disposable, but no more than any other existing canistered waste form. We believe that by developing robust performance requirements, this risk can be managed. It is the Department's intent to ensure that any risk with respect to the ultimate disposability of the TAD canister be appropriately considered and managed as we refine our acceptance process and criteria.

Compatibility of Transport, Aging, and Disposal Canister with Standard Disposal Contract

The Department understands that the utilization of TAD-based systems for the acceptance of spent nuclear fuel may require modifications to the disposal contracts that the Department has with the utilities. The Department believes that it will be able to address these issues with the majority of utilities, and that the goal of receiving 90 percent of the first 63,000 metric tons of spent nuclear fuel at Yucca Mountain in TADs is reasonable. We will design the surface facilities with enough flexibility and redundancy such that a variance from the 90 percent target can be accommodated.

Transport, Aging, and Disposal Canister Performance Specification Relationship to Postclosure Thermal Management Strategy

The Department understands that the Board is interested in how the TAD canister performance specification relates to the Department's postclosure thermal management strategy. The performance specification is being developed taking into account all the system requirements from waste acceptance to final disposal. Accordingly, it has been our intent to incorporate requirements that, while ensuring that the thermal performance of the TAD canister system would be consistent with the Department's current postclosure thermal-management approach, would provide sufficient flexibility to

accommodate alternative postclosure thermal management strategies. If, as a result of further analyses, the current postclosure thermal management approach is altered, we believe that such changes can be accommodated by altering the manner in which the TAD canister system is operated (i.e., by decreased surface aging), rather than by requiring changes to the TAD canister design.

Rail Line Contingency Planning

In a Record of Decision published in April 2004, the Department selected “mostly rail” as the mode of transport both nationally, and in the State of Nevada. The “mostly rail” option includes an expectation that some truck shipments will be made. In a Supplement Analysis to the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250F), the Department considered the potential environmental impacts of shipping legal-weight truck casks on railcars. This scenario involved shipments from generator sites to an intermodal transfer station that would be constructed and operated in Nevada and the subsequent transportation of those casks to a repository at the Yucca Mountain site by legal-weight trucks. In the event that the rail line is not completed when the repository begins operations, these truck transportation options would still be available for initial shipments to Yucca Mountain and will have been fully planned and ready for completion by that time. A full range of transportation contingencies are also being considered for shipment of TAD canisters in the event that the Nevada rail line is not available when the repository begins operations. However, we are planning the project to ensure that the rail line will be available at least one year before the repository begins operation.

Impact of Spent Fuel Litigation on Transport, Aging, and Disposal Canister Development

The Department disagrees with the Board’s representation that the existing litigation between the Government and the nuclear utilities over the delay in beginning the acceptance of spent nuclear fuel in 1998 is a significant impediment to the technical resolution of key issues regarding TAD canisters and the overall spent fuel management system leading to disposal. While the Department continues to encourage and support the resolution of the existing lawsuits through negotiated settlements, only the utilities can determine how they choose to resolve these disputes. Nonetheless, the Department believes that, although they may be complicated by the ongoing litigation, meaningful technical discussions can and do take place. This was demonstrated by recent technical interactions with the industry on the development of the TAD system performance requirements. We will continue to pursue a collaborative design approach with the private sector.

Total System Model Analyses

The Department appreciates the Board’s support for the Total System Model (TSM) as a tool to understand waste management system performance. The Department plans to continue the integrated systems engineering and analyses approach to gain a greater

understanding of the interrelationships between the subsystem components: waste acceptance, transportation, and repository operations. These continuing analyses are expected to provide additional insights as design details are further refined and operational scenarios are more fully defined, but will be sequenced to occur as details and scenarios are deemed ripe for consideration to ensure that realistic representations of the waste management system are analyzed.

As the Board is aware, the Department directed Bechtel SAIC Company, LLC, in October 2005 to update the repository surface facility design and operating concepts for the Yucca Mountain Project to adopt a primarily canister-based approach utilizing the TAD system. In compliance with the Departmental directives for this undertaking, a revised critical decision-1 (CD-1) package was prepared for submittal to the Department's Energy Systems Acquisition Advisory Board (ESAAB) to document and obtain approval for the revised approach. The thorough internal Departmental review and the approval process have been completed.

The CD-1 package contains a suite of documents describing the revised Project technical approach, cost, and schedule, along with documents for impact analysis. Now that approval of the CD-1 package by the ESAAB has been obtained, the baseline or "base (reference) case" analyses, including Total System Model results, will be updated to further analyze design scenarios, and specific details such as fuel blending and aging pad sizing.

The Department plans to continue a stepwise approach using the TSM tool to evaluate interrelationships and system responses with the transportation program. Throughout the TSM design evolution, the Department has briefed the Board on the inherent TSM capabilities to study upset conditions. The TSM design objectives are to ensure this flexibility is available by using an object oriented design approach and commercial off-the-shelf software to build the TSM. As the transportation program further refines its planning bases, logistics, and operational scenario, the Department will use TSM analyses with the same systems analysis approach to gain an understanding of the TAD-based system. Those future TSM studies of transportation scenarios will abstract data from transportation subsystem models when those model results are mature enough to establish realistic scenarios that merit evaluation.

Surface Facility Design

The Department appreciates the Board's interest in the surface facility design. Now that we have formal approval from the Department to implement the canister-based approach, we will commence preliminary design, and develop the design and safety analysis needed to support a License Application. We will also provide presentations to the Board describing in detail the design concept for the canister-based approach, including facility functions, layouts, and other items discussed in the Board's letter, as well as the results of the preliminary safety analyses.

The Board's expectation that the TSM is being used to validate the conceptual design is part of our ongoing work in this area. While not complete, the validation of the design concepts using the TSM is occurring at this time. As the design moves through the preliminary design process, the TSM will continue to be used to ensure that the design will meet the Department's requirements.

New Organization

The Department understands the Board's concerns with the Office of Civilian Radioactive Waste Management's (OCRWM) new organization and, in particular, the lack of a specific office with the responsibility for Project integration. As was discussed at the Board meeting, while the individual office directors are responsible for coordinating between offices, the Director, OCRWM, retains the ultimate responsibility to ensure overall Project integration. Upon my confirmation as Director, I began an assessment of the OCRWM structure, processes and competencies. The Board will be informed of the results of my assessment at a future meeting.

Relationship of Global Nuclear Energy Partnership and Yucca Mountain

The Department's Global Nuclear Energy Partnership (GNEP) is a closely coordinated long-term effort between multiple Program offices and national laboratories. One element of GNEP seeks to realize technologies that could enhance various aspects of the waste management system. There is no near-term impact of GNEP on Yucca Mountain. This is because there is no definition of the ultimate waste form and waste package that will result from the GNEP process. This information will not be developed until some time in the future. When it eventually becomes available, the resultant waste package will be qualified for disposal in Yucca Mountain; and an application for a license amendment will be submitted to allow disposal in the repository. The Department remains fully focused and will continue forward with the technical and scientific efforts to license and operate a geological repository at Yucca Mountain to address the spent fuel management of the current generation of nuclear reactors.