



UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201

January 16, 2008

Mr. Edward F. Sproat III  
Director  
Office of Civilian Radioactive Waste Management  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585

Dear Mr. Sproat:

Thank you very much for participating in the U.S. Nuclear Waste Technical Review Board's meeting in Las Vegas, Nevada, on September 19, 2007. The Board appreciated your overview of the Yucca Mountain Program and realizes that the Project is making an effort to complete numerous major milestones in the next few months. The meeting gave the Board an opportunity to look at program activities broadly and to ask whether the systems that are being proposed will work safely and efficiently, given current plans. The following paragraphs contain Board comments on information presented by DOE at the meeting and on the Board's assessment of how the designs for surface facilities and a transportation, aging, and disposal (TAD) canister-based repository might evolve in the future.

### ***TAD Canister Concept***

The Board considers TAD a promising concept that could result in a safer, simpler, and more efficient means of directly disposing of spent nuclear fuel. However, the success of TAD will depend on its being effectively integrated by DOE into the overall waste management system.

DOE has established requirements for a TAD-based repository design on the basis of the assumption that 90 percent of commercial spent nuclear fuel (CSNF) will arrive at the repository in TAD canisters. The Board understands that to help achieve that objective, DOE is negotiating with nuclear utilities on incentives that would make using TAD canisters more economically attractive. However, some nuclear power plants appear to lack the necessary infrastructure for using TAD canisters. This and other possible constraints (e.g., delays in TAD availability) make unclear whether a TAD utilization rate as high as 90 percent can be achieved. Because of this, the Board recommends that DOE carry out comprehensive analyses to understand better the implications of not achieving the 90 percent TAD utilization rate. Furthermore, the Board continues to encourage DOE to study actively all possible options for dealing with spent nuclear fuel in dual purpose canisters (DPC's) — including direct disposal.

### ***Surface-Facility Throughput***

The information presented by DOE on throughput rates for the surface facilities appears to be overly optimistic — that is, actual processing rates achieved by the surface facility complex as a whole may be lower than assumed. In some cases, operational activities do not appear to have been fully accounted for (e.g., upset conditions), which may further increase operational

times. In addition, if TAD utilization is reduced, the lower utilization rate could adversely affect surface facility throughput and could require construction of additional waste handling facilities. The Board recommends that DOE consider operational and design contingencies that could be implemented if TAD utilization rates turn out to be significantly lower than the 90 percent TAD utilization currently assumed.

The Board believes that DOE should consider adding supplemental operational features to current facility layouts as a means of addressing operational risk and mitigating constraints on facility throughput. Examples of measures that could improve throughput are increasing the capacity of the Wet Handling Facility (WHF) pool to allow parallel removal and transfer of fuel contained in DPC's, adding a welding station to the WHF to increase the capacity of the waste package welding stations, and increasing the number of welding stations in the Canister Receipt and Closure Facility (CRCF).

To assess operational risk and the viability of the waste management system, the Board recommends that DOE develop a series of realistic and detailed throughput analyses that go beyond a deterministic, steady-state approach. Such analyses should consider potential off-normal operational scenarios and should specifically address the throughput achieved by individual surface facilities, the integrated surface facility complex, and the waste management system as a whole.

### ***Transportation System***

Given the current configuration of the waste management system, the Nevada rail line is a critical factor that potentially will affect the viability of the entire waste management system. At this time, DOE does not consider alternative transportation modes to rail, such as a truck-based TAD transport system, realistic options because of their adverse effect on the throughput capacity and efficiency of the waste management system. The Board notes that technical, economic, political, and legal circumstances could create significant programmatic risks for the transportation system that DOE proposes to implement.

### ***Preclosure Safety Analysis (PCSA)***

At this time, the level of detail provided by DOE does not facilitate an in-depth assessment of the preclosure safety of surface facility design and concept of operations. The Board is concerned that the approach outlined for the development of the PCSA is a combination of deterministic and risk-informed, probabilistic methodologies. How DOE intends to address the uncertainties associated with the aggregation of risk is not clear to the Board. The Board would like DOE to explain in greater detail how the PCSA will address the remaining design uncertainties.

Thank you again for participating in the Board's September meeting. We look forward to your comments on the issues raised in this letter.

Sincerely,

{Signed by}

B. John Garrick  
Chairman