



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

December 11, 2012

Dr. Peter Lyons
Assistant Secretary for Nuclear Energy
Office of Nuclear Energy
U.S. Department of Energy
1000 Independence Avenue SW
Washington DC 20510

Dear Dr. Lyons:

On behalf of the U.S. Nuclear Waste Technical Review Board, I want to express its appreciation for your Office's outstanding support of the Board's meeting in Idaho Falls, Idaho on October 16-17, 2012.

Members' comments on the site visit to the Idaho National Laboratory were uniformly positive. They were pleased with the presentations and with the efforts that were made to prepare informative "poster talks" on research currently being conducted on, among other things, the physical properties of spent nuclear fuel (SNF). Moreover, notwithstanding the inclement weather, the tours of the various facilities provided opportunities to understand the scope of analytic and computational research activities being carried out at the laboratory. The participation by your team in the public meeting was equally valuable. The willingness of Dr. Monica Regalbuto to answer questions candidly and to interact informally with members of the Board and public throughout the meeting was especially appreciated.

As you may have learned, the meeting began with a valuable free-flowing discussion among Jim Williams, from the Western Interstate Energy Board, Earl Easton, from the NRC, and Jeff Williams from your Office. The discussion focused on how State Regional Groups could play important roles in working with the Department of Energy when substantial shipping campaigns of high-level radioactive waste (HLW) and SNF begin. The Board strongly recommends that your Office continue and strengthen its interactions with those groups.

As is its usual practice, in the following paragraphs, the Board provides its feedback on the information presented at the public meeting by members of your staff.

Transportation, Storage, and Disposal System Analyses

As indicated by several comments from the public at the meeting, transportation of HLW and SNF remains a major concern. It is by no means clear to those individuals that transporting this material, especially to a consolidated storage facility, will actually reduce risks. The Board

notes below that DOE needs to remain sensitive to this concern and address it in a candid and transparent fashion.

Dr. Mark Nutt discussed ongoing work to develop an integrated system architecture for managing commercial SNF from acceptance at reactor sites to disposal in a geologic repository. Such an architecture would recognize the realities of the current situation in which the disposition pathway for the widely used dual-purpose canisters is highly uncertain and where interest in standardized canisters is growing.

In the Board's view, the modeling results presented appear to be rudimentary accounting calculations that as yet do not yield particularly deep insights. Uncertainties in material flows do not seem to be represented. In addition, potential upsets in the flows are not incorporated into the modeling. The possibility of developing multiple sites, either for consolidated storage facilities or for the final repository, also is excluded from the architecture. The Board expects that these issues will be addressed as the system analyses mature.

Mr. Jeffrey Williams explained the circumstances surrounding stranded SNF at shutdown reactor sites. The information he presented has been available for many years. Providing photographs and "Google Earth" images of the each site, however, highlighted and made clearer the context and details of the geography adjacent to the facilities. The Board will be interested to hear more on this work as it progresses and will invite presentations on results at future meetings.

Mr. Williams described options for transporting the material once DOE accepts it for disposal, although he did not explain how challenges would be overcome to ready the fuel, which is today largely held in storage-only casks, for shipping. Those challenges include, but are not limited to, ensuring that the shortline rail spurs leading to some sites have been upgraded and, where necessary, loading the SNF into casks that have been certified for transportation. There also is some question about whether even the SNF currently stored in dual-purpose casks will need to be repackaged prior to shipment. One of the figures in Mr. Williams' presentation indicated that all of the transportation licenses for those casks will expire by May 2014 and that several transportation casks have not been fabricated at this time. These will be needed eventually. Although transportation cask *licensing* is not DOE's responsibility, the Board urges DOE to put a high priority on developing a comprehensive plan for ensuring that cask licenses and the yet-to-be-fabricated casks will be available to support DOE's transportation requirements and schedule.

Finally, an important issue of system integration was raised by the Board at the meeting. Many of the dry storage system designs presently in use contain material that may not meet the current criticality-control requirements for disposal. This situation raises the possibility that these storage systems may have to be opened and the fuel assemblies transferred into containers that conform to criticality-control regulations for disposal. The Board recommends that DOE evaluate the disposal criticality control of the dry storage systems presently being loaded.

Evaluations of Canister and Waste-Package Temperatures

Dr. Harold Adkins and Dr. Ernest Hardin made related presentations. Dr. Atkins' talk included an analysis of the thermal evolution of waste packages placed into dry storage. He developed a model for how the fuel cladding temperature would change over time and benchmarked it against data from SNF stored at the Calvert Cliffs Nuclear Power Station. Dr. Hardin, following up on his presentation to the Board in January, 2012, explored disposal conditions in "open" generic geologic repositories, where the emplacement media was salt, clay, and granite. In an open repository, there is an opportunity to ventilate the drifts (tunnels) containing the waste packages to remove some of their heat prior to repository closure. By removing some of the heat, larger sized packages could be disposed, especially if the thermal constraints are loosened.

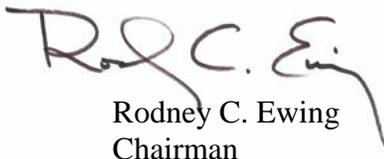
Both these presentations were technically refined and valuable. Together they suggest that there may be more flexibility in terms of waste-package size than had previously been presumed. The Board believes that this work should be continued. In particular, the two research strands should be coupled to provide temperature predictions of SNF cladding in a waste package that has been emplaced in a drift. Understanding such thermal evolutions could be important, if, for example, a package had to be retrieved.

The Importance of DOE Fully Engaging Stakeholders and Being Clear and Transparent

The Board was pleased to see mention made of communication issues in the presentation by Monica Regalbuto. The consent-based approach recommended by the Blue Ribbon Commission will require effective communication. In place of top-down models of communication that were common in the past, the Board believes that future efforts would benefit from an iterative, collaborative model that fully engages and involves stakeholders from start to finish. Having broad, meaningful stakeholder input throughout the process ensures that informational materials and communication products are informed by, and responsive to, the concerns and information needs of the public. In developing a plan to engage stakeholders early on, the Board urges DOE to draw upon the extensive body of literature on risk communication (particularly recent work on radiation risk communication) as well as important exemplars from successful health and environmental risk communication programs. By doing so, DOE would be able to ensure that its efforts are consistent with a consent-based approach, clear and transparent, and have a sound technical basis.

Once again, I would like to thank your team for its support of the Board's meeting. In the Board's view, it was a productive and, hopefully, a mutually beneficial gathering.

Sincerely,



Rodney C. Ewing
Chairman