The Honorable Inés R. Triay  
Assistant Secretary for Environmental Management  
U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Dear Dr. Triay:

The U.S. Nuclear Waste Technical Review Board held a public meeting in Idaho Falls, Idaho, on June 29, 2010. The principal topics were (1) management and ultimate disposition of the spent nuclear fuels (SNF) and high-level radioactive wastes (HLW) that are the responsibility of the U.S. Department of Energy’s Idaho Operations Office (DOE-ID) and the Naval Nuclear Propulsion Program and (2) future technologies and activities that could affect the amounts and forms of SNF and HLW that will require management and disposal or could affect the radioactive hazard levels of the SNF and HLW over time.

Several of the 11 people who made presentations at the meeting were employees of DOE-ID. We greatly appreciate their participation and the quality of their presentations.

The Board was established as an independent federal agency in the 1987 amendments to the Nuclear Waste Policy Act. The Board’s statutory role is to review the technical validity of activities undertaken by the Secretary of Energy related to implementation of the Nuclear Waste Policy Act. The Board reports its findings and recommendations to Congress and the Secretary of Energy at least twice a year. According to the legislative history, the Board is expected to make its recommendations before decisions are made, not after the fact. Thus, the Board established a practice many years ago of sending a follow-up letter after each of its public meetings to the appropriate DOE program managers. This letter continues that practice.

**DOE-ID Spent Nuclear Fuel**

Much of the SNF under the jurisdiction of DOE-ID already is in dry storage, and plans are under way to move the remaining SNF to dry storage. The Board has not identified any immediate technical issues with dry storage of this SNF. However, the Board recommends that the as-built lifetimes (as opposed to the design lifetimes) of all SNF dry-storage systems under DOE-ID’s responsibility be assessed because it is not known at this point when a repository or storage location outside Idaho will be available, and that uncertainty may continue well into the future. In addition, the Board believes that studies should be undertaken to identify and plan for actions that are needed for preventing problems from occurring during the transportation, repackaging, or disposal of SNF following extended...
periods of dry storage. Studies of the safety, cost, and technical issues associated with various
alternatives for managing, packaging, and transporting the SNF also would be invaluable to
the Blue Ribbon Commission for America’s Nuclear Future, to the Office of Environmental
Management for its long-term planning, and to the Board in setting priorities for its technical
peer review.

DOE’s National Spent Nuclear Fuel Program carried out extensive work in developing
packaging systems that would be acceptable for disposal in a repository at Yucca Mountain.
Whether the size, materials of construction, or other attributes of packaging developed for the
Yucca Mountain repository would be suitable for other geologic disposal media is not known.
Consequently, analysis of the issues associated with disposing of DOE-ID and other DOE-
owned SNF in geologic settings other than unsaturated tuff would be appropriate. The Board
recommends that DOE undertake such studies. This would include reexamination of studies
performed more than 25 years ago in the United States as well as examining more-recent
geologic disposal efforts of other countries.

DOE-ID Calcine

Virtually all of the liquid HLW at Idaho National Laboratory was calcined years ago
into a solid granular form and is being stored in shielded bins. The design lifetime of the bin
storage system is asserted to be 500 years. Designing a civil system made from ferrous alloys
and concrete for such a period is unprecedented. The technical basis for the design lifetime
estimate should be examined in detail, and the results of the examination — including any
assumptions regarding inspection and maintenance frequencies — should be conveyed to the
programs within DOE carrying out research on very-long-term dry storage. The results also
should be transmitted to outside entities now carrying out such research, including the Electric
Power Research Institute and the U.S. Nuclear Regulatory Commission.

In December 2009, DOE decided to treat the calcine by hot isostatic pressing before
transporting it off the site. The decision was based in part on a cost estimate comparing
various treatment alternatives. A key technical assumption affecting this decision was that
treated calcine would be loaded into “standardized canisters” (2 feet in diameter by 10 feet or
15 feet long) that would subsequently be loaded into larger outer containers for storage,
transportation, and disposal. This assumption may not be necessary for some treatment
methods yet may increase the number of containers requiring storage, transportation, and
disposal. In addition, it is not clear whether the operational risk of various treatment options
was taken into account or whether probabilistic risk assessments (PRAs) were performed on
the safety of the various alternatives after disposal in a repository. The Board believes that
another cost comparison should be conducted that takes into consideration appropriate
technical assumptions and the aforementioned risks.

DOE-ID Sodium-Bearing Waste

Whether sodium-bearing waste (SBW) is a high-level waste remains an open matter
that appears to be more of a regulatory issue than a technical one. Perhaps a risk assessment
could help in the determination. In any case, we agree that changing the SBW from its
current liquid form to a solid form is necessary.
More technical detail would be helpful in understanding and evaluating the basis for the selection of steam reforming for treating SBW. Although steam reforming is not a new technology, using it to treat SBW is a novel application. If SBW is classified as a high-level waste, the characteristics of the final waste form resulting from treating SBW with steam reforming and the final disposition of the resulting solid would be of particular interest to the Board.

Thank you for helping make the Board’s meeting in Idaho Falls a success.

Sincerely,

B. John Garrick
Chairman