



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

October 31, 2011

The Honorable Lee H. Hamilton
The Honorable Brent Scowcroft
Co-Chairs
Blue Ribbon Commission on America's Nuclear Future
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Representative Hamilton and General Scowcroft:

On behalf of the U.S. Nuclear Waste Technical Review Board, I am submitting comments to the Blue Ribbon Commission on America's Nuclear Future on the Commission's *Draft Report to the Secretary of Energy*, dated July 29, 2011.

As you know, the Board has followed closely the work of the Commission since the Commission was established in January 2010, and Board members and staff have testified on several occasions before the Commission and its subcommittees. In addition, we provided comments on June 30, 2011, on the draft reports issued by the Commission's Subcommittee on Disposal and Subcommittee on Transportation and Storage, and on July 14, 2011, on the draft report of the Commission's Subcommittee on Reactor and Fuel Cycle Technology. Those comments are available on the Board's website, www.nwtrb.gov, as well as on the BRC website. The comments in this letter are in addition to our comments on the subcommittee drafts.

The Board believes that the Commission's *Draft Report* reflects the substantial time and effort the Commission has invested in gathering information and in sorting through a diversity of views on policies that are needed to effectively manage the country's high-activity nuclear waste. The Board strongly concurs with the Commission's findings that deep geologic disposal is the most promising and accepted method currently available for safely isolating spent nuclear fuel (SNF) and high-level radioactive waste (HLW) for very long periods and that a permanent repository will be needed for any fuel cycle option that might be implemented in the reasonably foreseeable future. We also believe that as decisions are made on how to accomplish deep geologic disposal, it is very important that ongoing technical work should continue.

The Board's statutory mission is to evaluate the technical and scientific validity of Department of Energy (DOE) activities related to managing and disposing of SNF and HLW and to report Board findings, conclusions, and recommendations to Congress and the Secretary of

Energy. In the following paragraphs, the Board comments on technical topics discussed in the Commission's *Draft Report*.

Developing Generic Siting Criteria – The Board concurs with the Commission that development of generic repository siting criteria should proceed without delay. The Office of Used Nuclear Fuel Disposition Research and Development, which reports to the Deputy Assistant Secretary for Fuel Cycle Technologies within DOE's Office of Nuclear Energy, is commencing research on generic siting criteria. As a starting point for this work, it is very important that DOE take into account its past efforts related to developing siting criteria along with similar work that has been undertaken by nuclear waste repository programs in other countries. The Board notes that from a technical perspective, generic studies do not replace the need to focus on specific geologies and potentially available sites in the United States that may meet the criteria. The Board suggests that the Commission consider encouraging DOE's ongoing generic siting work in the Commission's final report.

Generic Research on Geologic Media – The Board concurs with the Commission's finding that experience in the United States and other countries has shown that from a technical perspective suitable sites for deep geologic repositories for the disposal of SNF and HLW can be identified and developed. This experience can be applied to geologies in the United States to identify potentially viable locations for detailed site characterization. DOE currently is planning research that will provide generic information on geologic media.

Methods of Deep Geologic Disposal, including Deep Borehole Disposal – The Commission's *Draft Report* discusses disposal in mined geologic repositories and in deep boreholes. In the Board's report on *Technical Advancements and Issues Associated with the Permanent Disposal of High-Activity Wastes: Lessons Learned from Yucca Mountain* issued earlier this year, the Board recommends that consideration be given to using different methods of geologic disposal for different kinds of wastes depending on their potential for reuse. While deep boreholes are suggested in the Commission's *Draft Report* as a substitute for mined geologic disposal, the Board recommends additional RD&D on deep borehole disposal to help resolve uncertainties about this approach and to allow for a more conclusive evaluation of its feasibility. Deep boreholes may play a role in disposal of small quantities of long-lived separated actinide wastes, but further study is needed on the effects of implementing this approach on the overall nuclear waste management system.

Radiation Source Term – The Commission's *Draft Report* discusses approaches to determining compliance with repository requirements. The Board believes that determining the radiation source term *realistically*, particularly with respect to the processes involved in mobilizing the waste, is critical to obtaining a fundamental understanding of the disposition of dose-contributing radionuclides. Such analyses can potentially help support a repository compliance case and can provide a much more credible understanding of how natural and engineered barriers would work together in a repository to contain and delay the release of radionuclides from the waste into the accessible environment.

Fuel-Degradation Mechanisms Related to Extended Dry Storage of SNF – The Board concurs strongly with the Commission that research is needed on fuel degradation mechanisms

and other factors that may affect the ability to store SNF for long periods. As discussed in the Board's report on *Extended Dry Storage and Transportation of Used Fuel*, issued in late 2010, the Board recommends that the ability to handle and transport such waste after extended storage also should be studied. DOE recently issued a draft "Gap Analysis" report on its research plans in this area and is collaborating closely with industry and with other government agencies, including the Nuclear Regulatory Commission and the Board, to develop its research program. The Board expects that this collaboration will result in a better understanding of the implications of extended dry storage.

Management of Federally Owned SNF and HLW – As noted in the Commission's *Draft Report*, DOE manages its own radioactive wastes from defense and research activities. Most of this waste is stored at three federal facilities: Hanford in Washington, Idaho National Laboratory (INL) in Idaho, and the Savannah River Site in South Carolina. DOE's Office of Environmental Management also participates with the state of New York in managing radioactive wastes from the country's only commercial reprocessing facility, which was located in West Valley, New York, and ceased operation in 1972. In addition, a joint DOE-Navy program manages spent naval reactor fuel at INL. The discussion of the wastes stored at these facilities in the Commission's *Draft Report* correctly reflects the importance of considering how these wastes should be managed and disposed of when evaluating options for permanent disposal of high-activity waste. The Board believes that a full discussion of the issues related to the need to permanently dispose of these wastes should be included in the Commission's final report.

The Board has visited the SNF and HLW management facilities at all four of these locations over the past two years and is preparing a report characterizing the amounts and types of wastes stored at each of them along with technical issues related to the management of the waste. The report will provide technical information for decision-makers as they discuss the Commission's recommendations on managing these wastes.

Effects of Various Fuel Cycle Technologies on SNF and HLW Management – The Board has consistently urged DOE to adopt a "systems" approach to radioactive waste management and strongly supports the Commission's finding that studies of alternative fuel-cycle technologies should account for linkages among all elements of the fuel cycle, including reactor technologies, fuel processing, transportation, storage, and disposal of SNF and HLW.

Transport of High Burnup Fuel – The Commission's *Draft Report* refers to the potential need to update regulations to allow for efficient transport of high burnup SNF. As mentioned above, the Board believes that research into technical factors associated with transporting such fuels also should be undertaken. As part of this exercise, the Board also advocates developing a technical basis for taking full credit for the loss of fuel reactivity as a result of burnup. The Board believes such work should have high priority because taking burnup credit potentially offers significant economies in developing a transportation system and cost savings at other stages of a spent fuel management program. The Board suggests that discussion of these issues be included in the Commission's final report.

International Cooperation – Over the last 20 years, the Board has engaged extensively with its counterparts in other countries that have nuclear waste programs and with the senior technical

personnel and managers of those programs to gain technical insights and perspectives that are useful in reviewing DOE activities. Information and analysis resulting from those interactions are included in two Board reports, *Survey of National Programs for Managing High-Level Radioactive Waste and Spent Nuclear Fuel* (October 2009) and *Experience Gained From Programs to Manage High-Level Radioactive Waste and Spent Nuclear Fuel in the United States and Other Countries* (April 2011). The Board has found its interactions with programs in other countries to be extremely valuable and joins the Commission in urging that U.S. program managers take full advantage of the experiences gained.

Retaining Technical Capability and Preservation of Technical Experience – The Board believes that it is imperative that information and data generated previously by the Office of Civilian Radioactive Waste Management be preserved in a reasonably accessible (electronic) form and recommends that the final Commission report address this important issue. Much of this information has generic attributes relevant to any geologic media. If the information and data are not retained, attempting to recover them after decisions are made on future waste management policies will be time-consuming and expensive. DOE’s Office of Legacy Management has developed a plan for transferring and preserving this information. The Board is reviewing DOE’s legacy management activities as part of its ongoing technical evaluation.

Many of these issues were discussed at a public meeting held by the Board in Salt Lake City, Utah, on September 13 and 14, which included a panel on the Commission's *Draft Report*. We were very pleased that John Kotek, the Commission’s Executive Director, was able to participate in that panel. We would like to thank him for providing an excellent and very useful overview of the Commission's *Draft Report*. The panel also included Mr. Ward Sproat, former director of DOE’s Office of Civilian Radioactive Waste Management, who presented his views on the *Draft Report*. The presentation by Mr. Sproat and the transcript from the meeting are available on the Board’s website.

We appreciate this opportunity to provide comments on the Commission’s *Draft Report*. We look forward to continuing our interactions and would be pleased to provide any additional technical information you might find useful as you prepare your final report.

Sincerely,

{Signed by}

B. John Garrick
Chairman