



U.S. NWTRB Priority Goals FY 2010-2011

Three Priority Goals

At its June 2009 public meeting in Las Vegas, the U.S. Nuclear Waste Technical Review Board's Chairman, B. John Garrick, articulated three priority performance goals that have begun to be implemented and that will help focus and direct the Board's work in FY 2010 and FY 2011. What follows is a discussion of what the Board has accomplished with respect to each of these performance goals, what it is planning to do in FY 2010 and how it intends to build on its ongoing work in FY 2011.

Goal 1. The Board will develop and compile objective technical information to inform the evaluation of waste management alternatives by Congress and the Secretary of Energy. The Board believes that this information also will be valuable to a Blue Ribbon Commission, if one is convened. In developing such information, the Board will look broadly at an integrated waste management system and potential waste-management alternatives. Specific tasks related to this goal are described below.

A. Systems Analysis. The Board recently began development of a computerized model of various U.S. waste management and disposal alternatives. The model has been designed to be extremely flexible so that it can represent a wide range of nuclear technologies, separation processes, and implementation time frames. The resulting analyses, which will be undertaken from FY 2010 through FY 2011, will allow the Board to provide Congress, DOE, a Blue Ribbon Commission, and other interested parties with an assessment of the technical implications of various options under consideration. Such assessments will include issues associated with on-site and centralized interim storage as well as final disposition.

The initial focus of this effort has been on evaluating reprocessing and MOX fabrication options, although future model enhancements will support representation of other nuclear options. Preliminary analyses performed to date have revealed several interesting and important findings. Some of the findings have to do with the number of times that spent nuclear fuel can be reasonably reprocessed. Others relate to tradeoffs in the amount and characterization of new wastes that would be created by these technologies versus the savings in spent nuclear fuel generated from raw nuclear materials. Still others demonstrate the time sensitivity associated with bringing these facilities online over the next 20 to 100 years.

B. "Stranded" DOE Spent Nuclear Fuel and HLW. The termination of the repository program leaves many thousands of tons of government-owned spent nuclear fuel and high-level radioactive waste with no place to go—at least temporarily. These wastes are stored primarily at Hanford in Washington, Idaho National Laboratory, and the Savannah River site in South Carolina. Many of the wastes are subject to legal agreements between the federal government and the respective states. The agreements cover the timely transportation offsite to a final disposal location. The Board recently visited Hanford to identify the amounts and characteristics

of such wastes at that site and plans for the disposition of the wastes under current legal agreements. Board meetings with the same objectives are scheduled for January 2010 and June 2010 at the Savannah River Site and Idaho National Laboratory, respectively. More meetings of this kind will be held in FY 2010-2011, including a meeting at the West Valley site that is planned but not yet scheduled. The Board anticipates issuing a report in FY 2011 that summarizes the amounts and characteristics of the waste, discusses the alternatives under consideration for their management and disposition, and identifies technical issues that need to be resolved.

C. Very-Long-Term Dry Storage. A likely consequence of a decision not to proceed with Yucca Mountain is that spent nuclear fuel will remain in storage for periods that may be much longer than previously anticipated. In late FY 2009, the Board convened a panel of experts to discuss research and data needs for very-long-term dry storage of commercial spent fuel. On the basis of those discussions and its own research, the Board is preparing a white paper on technical needs for very-long-term dry storage that is scheduled to be released in FY 2010 and expanded in FY 2011. The Board expects to use the white paper and its subsequent expansion to evaluate DOE technical activities related to long-term dry storage during FY 2010-2011 and to advise Congress, the Secretary, and a Blue Ribbon Commission if one is convened.

Goal 2. The Board will compile information gained from its extensive experience with the U.S. nuclear waste program and from observing waste management efforts in other countries. Specific tasks related to this goal are described below.

A. Survey of National Programs. Over the years, the Board has visited several countries whose long-term waste-management programs are relatively mature. The Board visited Japan's Underground Research Laboratory (URL) in the construction phase and has gone into URLs in France, Germany, Switzerland, Sweden, and Canada. The Board also has exchanged technical information and discussed with international scientists and engineers the technical challenges of developing a repository in a variety of host rocks, including granite, salt, clay, and argillite. The Board also has held detailed technical exchanges with operators of reprocessing plants in France and Japan and has visited their facilities. The Board has investigated technical issues associated with developing centralized interim-storage facilities for spent nuclear fuel in Germany, Switzerland, and Sweden. In FY 2010, the Board will travel to the United Kingdom, where it will meet with officials from the Nuclear Decommissioning Authority (DOE's counterpart organization in Britain), talk with local community participants in the United Kingdom's "Managing Radioactive Waste Safely" siting initiative, and visit the Sellafield Reprocessing Facility. In FY 2011, the Board likely will study alternatives to deep geologic disposal being considered in one other country, perhaps Germany.

The Board will soon issue a report titled *Survey of National Programs for Managing High-Level Radioactive Waste and Spent Nuclear Fuel*. In this document, the Board provides up-to-date factual information to Congress and the Secretary of Energy about the wide range of institutional arrangements and technical approaches that have been adopted in 13 countries. The *Survey* includes details that are unavailable from any other single source.

B. Study of "Lessons Learned." On the basis of its experience and understanding of waste management programs in other countries, its in-depth technical reviews of the Yucca Mountain Project, and the *Survey*, the Board will start to prepare in FY 2010 a "lessons learned" study. This major study will explore objectively the generic and specific issues associated with

developing a deep geologic repository in different media. The Board's technical expertise and its reputation for objective technical analysis will enable it to make a valuable and unique contribution to the national discussion of alternative waste management strategies and to provide advice on implementing whatever strategy the country subsequently adopts.

C. Source Term. As part of its examination of lessons that can be taken from the U.S. repository program and applied to a potential future repository, the Board is developing a paper that describes the application of risk assessment to repository performance by identifying the source term and the movement of radionuclides significant to dose through geologic barriers

Goal 3. To the extent that DOE engages in new technical work related to the management and disposal of high-level radioactive waste and spent nuclear fuel, the Board will continue to monitor and evaluate that work and report on the technical validity of that work to Congress and the Secretary. Specific tasks related to this goal are described below.

A. Nuclear Energy (NE). DOE's FY 2010 fuel-cycle research and development program carried out by DOE's Office of Nuclear Energy (NE) is almost entirely related to nuclear waste management and disposition. The program is being undertaken largely to improve options for waste storage and disposal, reduce the amount or longevity of waste, or promote safe and secure management of waste. The Board will continue to evaluate the technical validity of activities that are being conducted under the auspices of the fuel-cycle research and development program in FY 2010-2011. In particular, the Board intends to carefully scrutinize whether data developed in laboratories and pilot plants support predicted effects on waste management and disposal.

Most of the Board's September 2009 public meeting will focus on proposals from vendors on closing the nuclear fuel cycle. The proposals were sponsored by NE under the former Global Nuclear Energy Partnership program. The September 2009 meeting will likely lead to the Board's formulating a specific set of technical issues, which it will explore in depth during FY 2010 and FY 2011. (See Goal 2, A)

B. Corrosion. Deliquescence-induced localized corrosion and general corrosion rates have long been technical issues of interest to the Board and will be important to any plan for permanent underground disposal or for long-term dry storage of spent nuclear fuel and high-level radioactive waste. Several Board members and staff intend to visit Sandia National Laboratory in early FY 2010 to observe work that has been undertaken on those issues. The Board will report on its findings and recommendations related to the current program in its next summary report to Congress and the Secretary. These issues will be part of the Board's examination of lessons that can be learned about the engineered system from the experience of the U.S. program.

C. Environmental Management (EM). In contrast to the high-level waste at Hanford and Savannah River, which is mostly in liquid form in tanks, most of the high-level waste at Idaho National Laboratory is in a solid, granular form in bins. There is a question about how much additional treatment this waste needs, if any, to be a suitable waste form for disposal in a geologic repository. There are a number of options, including no additional treatment, mixing the waste with cement, hot isostatic pressing, vitrification, and others. During FY 2010, the Board intends to examine the technical bases for selecting the preferred option. The Board also will review the selection process. This will form the basis for work that will be undertaken in FY 2011, as discussed below.

Most DOE-owned spent nuclear fuel is in dry storage or soon will be moved to dry storage. All vitrified high-level radioactive waste is in dry storage. In FY 2011, the Board plans to evaluate the design bases for dry-storage facilities, beginning with the facilities at Savannah River. The objective of the evaluation will be to determine whether the design bases are suitable for supporting longer facility lifetimes and what additional data are needed. The Board does not plan any FY 2011 actions involving EM remediation or construction activities.

D. Office of Civilian Radioactive Waste Management (RW). Virtually no new technical work is being undertaken by OCRWM. Thus, Board effort involving RW in FY 2011 will be limited to determining if new work is being carried out. If new work is funded, the Board will evaluate its technical and scientific validity. RW has several approved but unfunded programs that are applicable to any repository. Chief among them are RW's burnup credit (criticality) and waste form (spent-fuel dissolution) programs.