

May 2003

Interested Parties:

The U.S. Nuclear Waste Technical Review Board (NWTRB) welcomes your comments on the attached NWTRB Strategic Plan for fiscal years 2003-2008. Please mail your suggestions to the attention of Karyn D. Severson, Director of External Affairs, NWTRB, 2300 Clarendon Boulevard, Suite 1300, Arlington, VA 22201; or send them by e-mail to plancomments@nwtrb.gov.

Thank you for your interest in the work of the Board.

Sincerely,

{Signed by}

Michael L. Corradini
Chairman

U.S. Nuclear Waste Technical Review Board

Strategic Plan

Fiscal Years 2003-2008

STATEMENT OF THE CHAIRMAN

The Nuclear Waste Policy Amendments Act of 1987 directed the U.S. Department of Energy (DOE) to characterize one site, at Yucca Mountain in Nevada, to determine its suitability as the location of a permanent repository for disposing of spent nuclear fuel and high-level radioactive waste. The Act also established the U.S. Nuclear Waste Technical Review Board as an independent agency within the executive branch of the United States Government. The Act requires the Board to evaluate continuously the technical and scientific validity of activities undertaken by the Secretary of Energy related to implementing the Act and to report its findings and recommendations to the Secretary and Congress at least twice yearly. Congress created the Board to perform ongoing independent and unbiased technical and scientific evaluation – crucial for public acceptance of decisions related to nuclear waste disposal.

In 2002, Congress approved the President’s recommendation that the DOE proceed to develop a license application for constructing a repository at Yucca Mountain. As a result, the DOE plans to prepare and submit an application to the Nuclear Regulatory Commission (NRC) for repository construction. The DOE plans to have the application ready for submittal to the NRC in December 2004. After the application is submitted, the NRC will have 3 years, with the option for a fourth, to review the application.

This strategic plan includes the Board’s goals and objectives for fiscal years 2003 through 2008. During that period, the DOE will develop a license application and will undertake important technical and scientific activities related to (a) gaining a better understanding of the potential behavior of a Yucca Mountain repository; (b) developing a repository design; (c) reducing technical uncertainties; (d) confirming estimates of repository performance; and (e) developing and implementing plans for a waste management system that incorporates waste transportation, handling, and packaging and repository operations. In accordance with its statutory mandate, the Board will continue its evaluation of the technical and scientific validity of the DOE’s work in these areas. Because many crucial technical and scientific decisions will be made throughout this period, the Board’s “systems view” of repository and waste management activities and its ongoing independent technical and scientific review of the DOE’s efforts will continue to be critically important.

On behalf of the Board,

{Signed by}

Michael L. Corradini
Chairman

MISSION

The Board's mission, established in the Nuclear Waste Policy Amendments Act (NWPAA) of 1987 (Public Law 100-203), is to “. . . evaluate the technical and scientific validity of activities [for management of high-level radioactive waste] undertaken by the Secretary after the date of the enactment of the Nuclear Waste Policy Amendments Act of 1987. . .” By law, the Board shall cease to exist not later than one year after the date on which the Secretary begins disposal of high-level radioactive waste or spent nuclear fuel in a repository.

VISION

By performing ongoing and independent technical and scientific review of the highest quality, the Board makes a unique and essential contribution to the implementation of the Nuclear Waste Policy Act (NWSA) of 1982, to the credibility of the scientific effort, to Congress's understanding of technical and scientific issues, and to the public's access to technical and scientific issues and information related to the disposal of spent nuclear fuel and high-level radioactive waste. The Board performs critical technical and scientific peer review of the DOE's work related to (a) gaining a better understanding of the potential behavior of a repository at Yucca Mountain; (b) developing a repository design for safe and efficient repository operations; (c) establishing a program for confirming estimates of repository performance; and (d) developing and implementing plans for a waste management system that incorporates waste transportation, handling, and packaging and repository operations.

VALUES

To achieve its goals, the Board conducts itself according to the following values:

- The Board strives to ensure that its members and staff have no conflicts of interest – real or perceived – related to the Secretary of Energy's efforts to implement the DOE's nuclear waste program.
- The Board members arrive at their conclusions on the basis of objective evaluations of the technical and scientific validity of the Secretary's activities.
- The Board's practices and procedures are open and conducted so that the Board's integrity and objectivity are above reproach.
- The Board's findings, conclusions, and recommendations are technically and scientifically sound and are based on the best available technical analysis and information.
- The Board's findings, conclusions, and recommendations are communicated clearly and in time for them to be most useful to Congress, the Secretary, and the public.
- The Board encourages public comment and discussion of DOE activities and Board findings, conclusions, and recommendations.

GOALS AND STRATEGIC OBJECTIVES

National Goals

The nation's goals related to the disposal of spent nuclear fuel and high-level radioactive waste were set forth by Congress in the NWPA. The goals are to develop a repository or repositories for disposing of high-level radioactive waste and spent nuclear fuel at a suitable site or sites and to establish a program of research, development, and demonstration for the disposal of such waste.

The NWPAA limited repository development activities to a single site at Yucca Mountain in Nevada. The NWPAA also established the Board and charged it with evaluating the technical and scientific validity of the Secretary of Energy's activities associated with implementing the NWPA. The activities include characterizing the Yucca Mountain site and packaging and transporting spent nuclear fuel and high-level radioactive waste.

The Board's general goals have been established in accordance with its statutory mandate and with congressional action in 2002 authorizing the DOE to proceed with the development of an application to be submitted to the NRC for constructing a repository at Yucca Mountain. The Board's goals reflect the continuity of the Board's ongoing technical and scientific evaluation and the Board's "systems view" of the repository and of waste management activities.

General Goals of the Board

To accomplish its congressional mandate, the Board has established four general goals:

1. Evaluate the technical and scientific validity of activities undertaken by the DOE related to understanding, testing, analyzing, and modeling geologic and other natural components of a proposed Yucca Mountain repository system.
2. Evaluate the technical and scientific validity of activities undertaken by the DOE related to modeling, understanding, testing, and analyzing the engineered components of a proposed Yucca Mountain repository system.
3. Evaluate the technical and scientific validity of activities undertaken by the DOE related to understanding and modeling the interactions of natural and engineered repository system components, estimating the performance of the proposed repository system, and integrating scientific and engineering activities.
4. Evaluate the technical and scientific validity of activities undertaken by the DOE related to planning, integrating, and implementing a waste management system, including the transportation, packaging, and handling of spent nuclear fuel and high-level radioactive waste and the operation of a repository.

Strategic Objectives of the Board

To achieve its general goals, the Board has established the following long-term objectives:

1. *Objectives Related to the Natural System*

- 1.1 Evaluate the technical and scientific validity of data and analyses related to the contributions of the natural barriers to waste isolation in a Yucca Mountain repository.
- 1.2 Monitor DOE analyses and investigations related to hydrologic, geologic, geotechnical, seismic, volcanic, climatic, biological, and other natural features, events, and processes at the Yucca Mountain site and at related analogue sites.
- 1.3 Monitor DOE efforts to increase fundamental understanding of the potential behavior of the repository in a natural system.
- 1.4 Evaluate DOE and other studies and analyses related to repository tunnel environments.*
- 1.5 Review DOE integration of technical and scientific activities related to the natural system.
- 1.6 Review DOE efforts to confirm estimates of natural-system performance, including tests of models and assumptions and the pursuit of independent lines of evidence.

2. *Objectives Related to the Engineered System*

- 2.1 Evaluate the technical and scientific validity of DOE data and analyses related to the contribution of the engineered system to waste isolation in a Yucca Mountain repository.
- 2.2 Evaluate DOE and other studies and analyses related to repository tunnel environments.*
- 2.3 Assess DOE efforts to increase understanding of fundamental corrosion processes in a proposed repository.
- 2.4 Review waste package designs, including the performance attributes and technical bases for such designs, and assess the need to revise waste package designs on the basis of the results of ongoing technical and scientific studies.
- 2.5 Evaluate the integration of science and engineering in the DOE program, especially the integration of new data into repository and waste package designs.

*This is a shared objective under the natural system and engineered system.

- 2.6. Review DOE activities related to confirming the predicted performance of the engineered system.

3. Objectives Related to Repository System Performance and Integration

- 3.1. Evaluate the technical and scientific validity of the DOE's technical basis for its estimates of repository system performance.
- 3.2. Review the technical and scientific validity of DOE models used to predict repository system performance.
- 3.3. Evaluate DOE efforts to increase confidence in its estimates of repository performance.
- 3.4. Evaluate the technical and scientific validity of DOE efforts to gain a more realistic understanding of the interaction of the natural and engineered components of a repository system.
- 3.5. Evaluate the integration of science and engineering with performance assessment.
- 3.6. Evaluate the technical bases for the DOE's repository safety case, including efforts to integrate the safety case with multiple lines of evidence and performance confirmation.
- 3.7. Monitor the development of DOE plans and activities for performance confirmation.

4. Objectives Related to the Waste Management System

- 4.1. Review DOE efforts related to the interaction of components of the waste management system from a life-cycle systems perspective, including at-reactor storage, waste acceptance, transportation, and repository design and operations.
- 4.2. Review the technical and scientific validity of the DOE's plans for safely handling and packaging spent nuclear fuel and high-level radioactive waste for transport to a permanent repository and for disposal in a permanent repository.
- 4.3. Review the technical and scientific aspects of the DOE's transportation plans.
- 4.4. Review the technical and scientific validity of the DOE's plans for developing a transportation infrastructure.
- 4.5. Evaluate design and engineering of the facility components or subsystems that involve innovative features, assumptions, and approaches.

- 4.6. Review the process through which the DOE provides technical and scientific information to stakeholders and includes stakeholders in the development of waste management plans.

ACHIEVING THE GOALS AND OBJECTIVES

The NWPAA grants significant investigatory powers to the Board. In accordance with the NWPAA, the Board may hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence as it considers appropriate. By law, no nominee to the Board may be an employee of the DOE, a National Laboratory, or DOE contractors performing activities related to high-level radioactive waste or spent nuclear fuel.

At the request of the Board and subject to existing law, the NWPAA directs the DOE to provide all records, files, papers, data, and information requested by the Board, including drafts of work products and documentation of work in progress. According to the legislative history, in providing this access, Congress expected that the Board would review and comment on DOE decisions, plans, and actions as they occurred, not after the fact. The Board has the power, under current law, to achieve its goals and objectives.

In conducting its ongoing technical and scientific review, the Board takes a systems view of the repository and of waste management activities. Consistent with this approach, the Board has established the following four panels with purviews corresponding to the Board's general goals:

1. Panel on the Natural System

Panel Goal: Evaluate the technical and scientific validity of activities undertaken by the DOE related to understanding, testing, analyzing, and modeling geologic and other natural components of a proposed Yucca Mountain repository system.

2. Panel on the Engineered System

Panel Goal: Evaluate the technical and scientific validity of activities undertaken by the DOE related to modeling, understanding, testing, and analyzing the engineered components of a proposed Yucca Mountain repository system.

3. Panel on Repository System Performance and Integration

Panel Goal: Evaluate the technical and scientific validity of activities undertaken by the DOE related to understanding and modeling the interactions of natural and engineered repository system components, estimating the performance of the proposed repository system, and integrating scientific and engineering activities.

4. Panel on the Waste Management System

Panel Goal: Evaluate activities undertaken by the DOE related to planning, integrating, and implementing a waste management system, including the transportation, packaging, and handling of spent nuclear fuel and high-level radioactive waste and the operation of a repository.

Much of the Board's information gathering occurs at open public meetings arranged by the Board. At each meeting, the DOE, its contractors, and other program participants present technical information according to an agenda prepared by the Board. Board members and staff question presenters during the meetings. Time is provided at the meeting for comments from members of the public and interested parties. The full Board holds three or four meetings each year, usually in Nevada. The Board's panels meet as needed to investigate specific issue areas.

The Board also gathers information through field trips to the Yucca Mountain site, visits to contractor laboratories and facilities, and meetings with individuals working on the project. Board members and staff attend national and international symposia and conferences related to the science and technology of nuclear waste disposal. From time to time, Board members and staff also visit programs in other countries to review best practices, perform benchmarking, and assess potential analogues.

Although the Board's information-gathering activities are carried out primarily to further the Board's review, they often have the collateral benefit of promoting communication and integration of technical information within the DOE program and facilitating the dissemination of information among interested parties outside the program. Analyses are performed primarily by Board members and the Board's staff. When necessary, the Board hires special expert consultants to perform in-depth reviews of specific technical and scientific topics.

CROSSCUTTING FUNCTIONS

Several entities and agencies are involved in developing a system for safely packaging, transporting, and disposing of spent nuclear fuel and high-level radioactive waste in a geologic repository at a suitable site. As discussed in the following paragraphs, the Board's ongoing peer review and systems approach is unique among those involved in managing spent nuclear fuel and high-level radioactive waste.

- *Congress and the Administration, including the Secretary of Energy*, make decisions on national policy and goals and how they will be implemented. The Board's role in this process is to help ensure that policy-makers receive unbiased and credible technical and scientific analyses and information.
- *State and local governments* comment on and oversee DOE activities. The Board's oversight activities are different in that they are (1) unconstrained by any stake in the outcome of the endeavor besides the credibility of the scientific and technical activities; (2) confined to scientific and technical evaluations, and (3) conducted by individuals nominated by the National Academy of Sciences and expressly chosen by the President for their expertise in the various disciplines represented in the DOE program.
- *Other federal agencies* (in addition to the Board) with roles in the waste management program include the DOE, the NRC, the Environmental Protection Agency (EPA), the Department of Transportation (DOT), and the United States Geological Survey (USGS). The DOE and its

contractors are responsible for developing and implementing waste management plans and for conducting analytical and research activities related to licensing, constructing, and operating a repository. The NRC is the regulatory body with responsibility for licensing the construction and operation of a proposed repository and for certifying transportation casks. The EPA is responsible for issuing radiation safety standards that the NRC uses to formulate its repository regulations. The DOT is responsible for regulating the transporters of the waste. The USGS participates in site-characterization activities at the Yucca Mountain site. The Board's role and its systems approach are unique among these federal agencies: perform ongoing, independent review and expert oversight of the technical and scientific validity of the Secretary of Energy's activities relating to civilian radioactive waste management and communicate its findings and recommendations to Congress, the Secretary, and the public. The Board's technical and scientific evaluations enhance the work of other agencies involved in achieving the national goal.

KEY EXTERNAL FACTORS

Some factors that are beyond the Board's control could affect its ability to achieve its goals and objectives. Among them are the following:

- *The Board has no implementing authority.* The Board is by statute a technical and scientific review body that can only make recommendations to the DOE. Congress expected that the DOE would accept the Board's recommendations or indicate why the recommendations could not or should not be implemented. However, the DOE is not legally obligated to accept any of the Board's recommendations.

To increase its effectiveness, the Board has developed procedures for increasing the relevance of its findings and recommendations for Congress, the Secretary, DOE program managers, and the public. The Board's recommendations and the DOE's responses are included in Board reports to Congress and the Secretary. If the DOE does not accept a Board recommendation, the Board's recourse is to advise Congress or reiterate its recommendation to the DOE, or both.

- *Legislation and budget considerations could affect nuclear waste policy.* Congress has considered nuclear waste legislation several times in the last few years. The effects of such legislation, if enacted, on the program or the Board's activities are not currently known. In addition, the level of funding provided to the Board affects its ability to comprehensively review DOE activities. Funding levels for the program also may influence activities undertaken in a given year or over time.

The Board will evaluate the status of these external factors, identify any new factors, and, if warranted, modify the "external factors" section of the strategic plan as part of the annual program evaluation described below.

EVALUATING BOARD PERFORMANCE

The Board believes that measuring its effectiveness by directly correlating improvements in the DOE program with Board actions and recommendations would be ideal. However, the Board has no implementing authority. Consequently, a judgment about whether a specific recommendation had a positive outcome for the DOE program is, in most cases, (1) subjective and (2) an imprecise indicator of Board performance because implementation of Board recommendations by the DOE is outside the Board's direct control. Therefore, to measure its performance in a given year, the Board has developed performance measures. For each annual performance goal, the Board considers the following.

1. Were the reviews, evaluations, and other activities undertaken under the auspices of the goal completed?
2. Were the results of the reviews, evaluations, and other activities communicated in a timely, understandable, and appropriate way to Congress and the Secretary of Energy?

If both measures are met, the Board's performance in meeting the annual goal will be judged effective. If only one measure is met, the performance of the Board in achieving that goal will be judged minimally effective. Failing to meet both performance measures without sufficient and compelling explanation will result in a judgment that the Board has been ineffective in achieving that performance goal.

The Board will use its evaluation of its own performance from the current year, together with its assessment of current or potential key issues of concern related to the DOE program, to establish its annual performance objectives and develop its budget request for subsequent years. The results of the Board's performance evaluation are included in its annual summary report.

CONGRESSIONAL AND STAKEHOLDER CONSULTATIONS

In developing its original strategic plan, the Board consulted with the Office of Management and Budget, the DOE, congressional staff, and members of the public and provided a copy of the plan to the NRC and to representatives of state and local governments. The Board solicited public comment and presented its strategic plan at a session held expressly for this purpose during a public Board meeting in Amargosa Valley, Nevada, on January 20, 1998. The Board is soliciting public comment on its revised strategic plan and performance plan for fiscal year 2004. Copies of the Board's strategic plan and annual performance plans and forms for providing comment are available on the Board's Web site: www.nwtrb.gov.