

## What is the U.S. Nuclear Waste Technical Review Board?

### Yucca Mountain

In 1987, Congress selected a site at Yucca Mountain in Nevada as the only site to be characterized as a potential underground repository for the permanent disposal of the nation's commercial spent nuclear fuel and high-level radioactive waste. Yucca Mountain is in Nye County, about 100 miles northwest of Las Vegas .

Characterization of Yucca Mountain continued until 2002, when President George W. Bush recommended the site for repository development. The President's recommendation was approved by Congress later that year. The DOE is developing an application to be submitted to the Nuclear Regulatory Commission for authorization to construct a repository at Yucca Mountain.

Congress created the U.S. Nuclear Waste Technical Review Board (the Board) in the 1987 amendments to the Nuclear Waste Policy Act to review the Department of Energy's (DOE) technical and scientific activities related to disposing of the nation's commercial spent nuclear fuel and high-level radioactive waste. These activities include characterizing the Yucca Mountain site, as well as packaging and transporting the waste.

### How Does the Board Implement its Congressional Mandate?

The Board performs a continuous independent and expert technical review of the DOE program and reports its conclusions and recommendations to Congress and the Secretary of Energy at least two times a year. In conducting its ongoing review, the Board:

- Makes scientific and technical recommendations to the DOE before decisions are made, not after the fact.
- Takes a "systems" view of repository performance and waste management.
- Fosters discussion and understanding of complex scientific and technical issues related to disposing of, transporting, and packaging spent nuclear fuel and high-level radioactive waste.

### Who serves on the Board?

The Nuclear Waste Policy Amendments Act authorizes a board of 11 part-time members who are eminent in a field of science or engineering — including environmental, and social sciences — and who are selected solely on the basis of distinguished service. The National Academy of Sciences recommends a slate of candidates from which the President makes appointments to the Board.

### How does the Board contribute to the process?

By performing ongoing and independent technical and scientific review, the Board makes a unique contribution to the credibility of the scientific effort and to understanding of critical technical and scientific issues.

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# NWTRB Viewpoint

## October 2004

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To accomplish its goals and objectives, the Board has organized itself into the following panels:

- Panel on the Natural System - Evaluates DOE activities related to analyzing the natural components of a proposed Yucca Mountain repository system.
- Panel on the Engineered System - Evaluates DOE activities related to analyzing the engineered components of a proposed Yucca Mountain repository system.
- Panel on Repository System Performance and Integration - Evaluates DOE activities related to estimating the performance of the proposed repository system, and integrating scientific and engineering activities.
- Panel on Waste Management System - Evaluates DOE activities related to implementing a waste management system, including transportation, packaging, and handling spent nuclear fuel and high-level radioactive waste and operating a proposed repository.

### Board Members

B. John Garrick, Ph.D., was appointed to the Board as Chairman on September 10, 2004, by President George W. Bush. He is an executive consultant. His areas of expertise include the application of the risk sciences to complex technological systems in the space, defense, chemical, marine, and nuclear fields.

Mark D. Abkowitz, Ph.D., is professor of civil and environmental engineering at Vanderbilt University. His areas of expertise include the technology of transportation, risk management and risk assessment, and emergency preparedness.

William Howard Arnold, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is a private consultant. His areas of expertise include nuclear project management, organization, and operations.

Daryle H. Busch, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is the Roy A. Roberts Distinguished Professor of Chemistry at the University of Kansas and deputy director of the NSF Engineering Research Center, which has the title Center for Environmentally Beneficial Catalysis. His areas of expertise include homogeneous catalysis, bioinorganic chemistry, and orderly molecular entanglements, a part of supramolecular and nanochemistry.

Thure E. Cerling, Ph.D., is Distinguished Professor of Geology and Geophysics and professor of biology at the University of Utah. His areas of expertise include terrestrial geochemistry and geochemistry processes.

David J. Duquette, Ph.D., is department head and professor of materials engineering at Rensselaer Polytechnic Institute. His areas of expertise include physical, chemical, and mechanical properties of metals and alloys.

George M. Hornberger, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is Ernest H. Ern Professor of Environmental Sciences in the Department of Environmental Sciences at the University of Virginia. His areas of expertise include catchment hydrology and hydrochemistry centered on the coupling of field observations with mathematical modeling.

Andrew C. Kadak, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is Professor of the Practice in the Nuclear Engineering Department at the Massachusetts Institute of Technology. His areas of expertise include nuclear management and the development of advanced nuclear reactors.

Ali Mosleh, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is a professor and director of the Reliability Engineering Program and director of the Center for Risk and Reliability at the University of Maryland. His areas of expertise include methods for probabilistic risk analysis and reliability of complex systems.

Henry Petroski, Ph.D., was appointed to the Board on September 10, 2004, by President George W. Bush. He is Aleksandar S. Vesic Professor of Civil Engineering and a professor of history at Duke University. His areas of expertise include failure analysis and design theory.