Introductory Remarks to the Panel on Closing the Fuel Cycle and Recycling Paradigms

Presented to:

INMM Spent Fuel Management Seminar XXVII

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February 2, 2012 Crystal Gateway Marriott Hotel, Arlington, VA

About the Board

- Established by the 1987 amendments to the Nuclear Waste Policy Act (NWPA) to:
  - Evaluate the "technical and scientific validity" of DOE activities related to implementing the NWPA, including
    - Transportation, packaging, and storage of spent nuclear fuel (SNF) and high-level radioactive waste (HLW)
    - Site characterization, design, and development of facilities for disposing of such wastes.
- The Board is required by law to report its findings, conclusions, and recommendations at least twice each year to Congress and the Secretary of Energy.
- Eleven Board members:
  - technical and scientific experts
  - nominated by the National Academy of Sciences; appointed by the President
  - serve on a part-time basis for four-year terms.
- Board documents: meeting transcripts and materials, correspondence reports, congressional testimony, etc. can be found at www.nwtrb.gov.

Fuel Cycle Analysis using NUWASTE

- Nuclear Waste Assessment System for Technical Evaluation
- PC-based tool for analysis of U.S. SNF management scenarios
- Current LWR fleet, shut down reactors and new-build
- Projects generation of SNF and HLW over time
- Material flows/mass balance for all process stages
- Once-through, reprocessing/single recycle and hybrid scenarios
- Report on Status and Initial Results issued June 2011: assessment of four scenarios, including:
  - Storage cask requirement
  - Repository disposal package requirement
  - Impact of U and Pu recycle on natural uranium demand
  - Waste stream quantities
- Workshop held June 2011 to compare results with systems developed by MIT, INL, AREVA and UK National Nuclear Laboratory

Relevant Points From the Board's Response to the Draft BRC Report

- Recommends a systems approach to the program for SNF/HLW management
- Concurs that a repository will be needed for any fuel cycle option
- Recommends priority be given to research related to transportation of high-burnup fuel and the technical basis for taking burnup credit
- Concurs that research into fuel degradation mechanisms is needed
- Concurs in urging increased international cooperation to benefit from experience gained in other countries
- Recommends that ongoing technical work continue as decisions are made on how to accomplish deep geologic disposal
- Concurs with recommendation to develop generic repository siting criteria
- Concurs that, from a technical perspective, a repository site can be found and developed
- Recommends consideration of different disposal methods for different waste-types
- Determining the source term realistically can support the repository compliance case
- Discussion of disposal of DOE-owned waste is needed in the BRC final report
- Believes it is imperative that information generated by OCRWM be preserved