Enhancing Confidence, Technology, and Efficiency for Radioactive Waste Management

Presented to:
Nuclear Waste Technical Review Board

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Outline

- Overview of the proposed science and technology program
- Relationship of the science and technology program to performance confirmation
- Task force scope of work
- Examples of areas of investigation
- Summary
Overview

- DOE has endorsed a detailed work plan (DWP) through license application (LA)
  - Work scope adequate to support preparation of a viable LA by late 2004
  - Addresses NRC’s key technical issues and licensing requirements
  - Addresses quantifying uncertainties

- We are committed to continued scientific investigations to enhance the understanding of the natural and engineered systems, and long-term performance
Overview

(Continued)

• Consistent with the DOE’s objective of “Long-term Stewardship,” a DOE/BSC task force has been established to develop a proposed science and technology program with the intent of
  – Increasing confidence in projections of performance and understanding of the repository system
  – Improving existing technologies used in the waste management system
  – Promoting efficiencies in the repository system
Overview  
(Continued)

- Task force will make recommendations to DOE/BSC management on possible science and technology strategies and work scope
- Science and technology program activities supplement work planned for LA and will not impact the resources necessary to complete the LA
Performance Confirmation

- Performance confirmation (PC) is required by NRC (10 CFR 63, Subpart F)
  - DOE’s current PC plan will be revised
  - PC plan will be a part of the LA

- DOE’s science and technology program will be broader than the PC program
  - Science and technology will address issues and alternatives beyond the basis for the safety case

- Data collection supporting PC began prior to the completion of site characterization
Science and Technology Program
Scope of Work

• Identify potential work scope that will
  – Contribute to the OCRWM’s long-term objectives and goals (long-term stewardship)
  – Increase our understanding of the natural and engineered systems and projections of long-term performance

• Evaluate work scope to address technical issues raised internally and by oversight groups
  – Track technical issues through resolution
  – Handoff to other Project organizations for implementation
Science and Technology Program
Scope of Work
(Continued)

- Coordinate with other DOE offices, universities, international programs, and other scientific organizations to improve communication and cooperation that enhances information exchange

- Identify and plan tests, develop models, and perform analyses that will contribute to our understanding of long-term performance
Science and Technology Program
Scope of Work
(Continued)

- Identify appropriate milestones for reporting progress and results
- Foster excellence within the Project by encouraging publication in peer-reviewed, technical journals
- Investigate new, “out of the box” concepts and emerging technologies to improve the waste management system
Examples

- Technical areas that will be considered in the science and technology program
  - Level III activities (additional technical basis) from the risk prioritization activity conducted to prepare the DWP through LA
  - Technical issues common to all repository programs
    - Radionuclide transport (anion transport and use of advanced material technologies to improve retardation)
    - Fracture/matrix flow
    - Use of probabilistic approach
    - Analogue studies to support multiple lines of evidence
  - Toxicity/volume reduction of waste
Summary

- We are developing a science and technology program to meet the OCRWM Program objective of long-term stewardship

- Task force is currently developing proposal that will include
  - Identification and planning of
    - Supplemental long-term testing and analyses
    - Development of technologies to improve long term performance and reduce repository costs
  - Coordination with university and international programs to interface with the Yucca Mountain science and engineering program

- We encourage the Board’s input in developing this program