Agenda

Spring 2001 Board Meeting
Scientific and Technical Issues

Hilton Arlington & Towers
950 North Stafford Street
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Tuesday; May 8, 2001

8:00 a.m. **Call to order and introductory comments**
Jared Cohon
Chairman
Nuclear Waste Technical Review Board (NWTRB)

8:10 a.m. **Program update**
Lake Barrett
Acting Director
Office of Civilian Radioactive Waste Management (OCRWM)
U.S. Department of Energy

8:35 a.m. Questions, discussion

Morning Session: Norm Christensen, NWTRB, Chair

8:45 a.m. **Revision of OCRWM FY 2001 workplan**
Stephan Brocoum
Assistant Manager, Office of Regulatory and Licensing Compliance
Yucca Mountain Site Characterization Office (YMSCO)

Jerry King
Project Manager, Site Recommendation
Bechtel SAIC Company (BSC)

9:30 a.m. Questions, discussion

9:45 a.m. **BREAK**

10:00 a.m. **Design update**

It appears that the Yucca Mountain Project intends to evaluate and compare the base-case repository design with a low-temperature design by developing a "flexible" design that will then be evaluated for "hot" and "cold" operating conditions. What exactly does "flexible" mean in this context? What characteristics does DOE use to determine flexibility? Is the current base-case design flexible? If so, explain why. If not, explain what would need to be changed. How much may a design be changed and still be considered the same design?

Larry Trautner
Project Manager, Repository Design
BSC

10:40 a.m. Questions, discussion

11:00 a.m. **Multiple lines of evidence**

Abe Van Luik
Senior Policy Advisor for Performance Assessment, YMSCO

12:00 p.m. Questions, discussion

12:30 p.m. **LUNCH**

Afternoon Session: Alberto Sagüés

1:30 p.m. **Uncertainty analyses: current state of activities**

William Boyle
Senior Advisor for Regulatory Policy, YMSCO

2:10 p.m. Questions, discussion

2:30 p.m. **Performance assessment: natural system**

What is the long-term climate model and what is it based on? What are the effects of this model (without assuming reduced neptunium solubility through secondary phases of uranium) on the nominal case, peak dose, and the igneous intrusion scenario? What are the effects of this model on sensitivity studies and neutralization studies carried out for periods longer than 10,000 years? How does it affect conclusions about multiple barriers and defense-in-depth?

Saxon Sharpe
Assistant Research Professor
Desert Research Institute

Jerry McNeish
Manager, Total System Performance Assessment
Duke Engineering

3:10 p.m. Questions, discussion

3:30 p.m. **BREAK**

3:45 p.m. **Performance assessment: engineered system**

1. Although the DOE has considered early failures of waste packages in performance assessment sensitivity analysis, there seem to be no other explicit considerations of possible differences that may evolve over time between performance of the engineered barrier system components as they have been designed and their performance as they actually may be built and installed. Using the following two hypothetical examples, please describe how performance might vary:

a. The proposal is to treat the waste package's final closure welds by laser peening and induction annealing to delay the possible onset of stress-corrosion cracking. Neither technology has been demonstrated at commercial scale for the waste package application. What are the performance (dose) consequences if one or the other or both of these technologies are never perfected for the waste package application?

b. The drip shield will not perform its function unless it is properly placed and remains in place through rockfalls, seismic events, and other disruptions. Assuming that some fraction of the drip shields fails shortly after closure, what would be the effect on performance?

2. During postclosure, temperatures in the emplacement drift will gradually fall, thermal gradients may dissipate, and relative humidity will significantly increase. Although forced ventilation will have been terminated at the end of preclosure, natural ventilation will occur in emplacement drifts because of external barometric fluctuations. Natural convection could produce localized environmental conditions within the emplacement drifts; under this scenario, it is not clear if the drip shield will function as intended.

a. To what extent does TSPA account for localized environmental effects when single stand-alone or coupled drip shield configurations are utilized with variable waste package separation?

b. What is the potential (i) for significant surface-temperature differences between adjacent waste packages and drip shields, i.e., cold traps; (ii) the formation of thin or thick films on the surface of the waste package; (iii) dripping to occur under the drip shield?

c. Do current drip shield models adequately characterize and bound drip shield performance?

3a. Certain features, events, and processes related to engineered barrier systems were screened out during the FEP evaluations; others were included. If the potential repository were operated in a cooler thermal mode, which FEP's previously screened out would be included and vice versa?

3b. If subgrade structural steel corrodes the waste package or pallet, the drip shield may misalign as a result of settlement into the invert structure. At a minimum, this would produce asymmetry in the surface temperatures of the waste package and the drip shield.

3c. To what extent do this or similar events have a significant effect on waste package, drip shield, and invert performance?

3d. Have the corrosion products of EBS's and materials, such as the ground support, been considered in the postclosure EBS environment?

Robert Howard
Integration Manager, Science and Analysis
BSC

Robert McKinnon
Manager, Engineered Barrier System
BSC and Lawrence Livermore National Laboratory

4:25 p.m. Questions, discussion

4:45 p.m. DOE Waste Package Performance Peer Review

Joe Payer
Case Western Reserve University

4:55 p.m. Questions, discussion

5:00 Public comments

5:30 p.m. Adjournment

Wednesday; May 9, 2001

8:00 a.m. **Introduction**
Jeffery Wong
NWTRB

8:05 a.m. **Yucca Mountain scientific and engineering update**
Mark Peters
Los Alamos National Laboratory
9:15 a.m. Questions, discussion

9:35 a.m. **Corrosion-related investigations sponsored by the Nuclear Regulatory Commission at the Center for Nuclear Waste Regulatory Analysis (CNWRA)**
Narasi Sridhar
CNWRA
10:15 a.m. Questions, discussion

10:35 a.m. **BREAK**

Joint DOE-State of Nevada Study to Date Fluid Inclusions at Yucca Mountain

10:50 a.m. **Findings and interpretations (I)**
Jean Cline
Principal Investigator, University of Nevada-Las Vegas
11:10 a.m. Questions, discussion

11:25 a.m. **Findings and interpretations (II)**
Yuri Dublyanksy
Contractor, State of Nevada
11:40 a.m. Questions, discussion

11:50 a.m. **Findings and interpretations (III)**
Joe Whelan
U.S. Geological Survey
12:05 p.m. Questions, discussion

12:15 p.m. **Findings and interpretations (IV)**
Robert Bodnar
Virginia Polytechnic Institute and State University
12:25 p.m. Questions, discussion

12:35 p.m. **DOE comments on the fluid inclusion study**
William Boyle
Senior Advisor for Regulatory Policy, YMSCO

12:40 p.m. Questions, discussion

12:45 p.m. **Public comments**

1:15 p.m. **Adjournment**