



UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
1100 Wilson Boulevard, Suite 910  
Arlington, VA 22209

## Agenda

### Panel on Structural Geology & Geoengineering Workshop on the Exploratory Studies Facility (ESF) Design and Construction Strategy

Plaza-Suite Hotel  
4255 South Paradise  
Las Vegas, NV 89109  
(702) 369-4400

#### **November 4 & 5, 1992**

The Nuclear Waste Technical Review Board's (the Board) fourth and fifth reports to Congress and the Secretary of Energy discuss the need for access to the underground as a key part of the early assessment of the suitability of Yucca Mountain as a potential site for a deep geologic repository for the nation's spent nuclear fuel and defense high-level waste. The reports also recommended that strategies be developed to allow underground construction and testing to proceed with reduced budgets. In recent months, the Board has emphasized the need to minimize start-up costs of tunneling so that limited funds could be applied to starting tunneling with a single tunnel boring machine in late fiscal year (FY) 1993 or early FY 1994. The Department of Energy (DOE) has recently allocated the FY 1993 funds and developed plans to accomplish such a result. The purpose of this Board-sponsored workshop is to define and discuss the technical merits, costs, and schedules of strategies for underground construction and testing in the ESF.

This workshop is organized around four sessions that are intended to bring together construction, testing, and management perspectives. In an effort to seek broad and open participation, a major portion of each session is devoted to round-table discussions following minimum introductory presentations.

#### **Wednesday, November 4, 1992**

**8:00 A.M.**      **Welcome**  
Clarence R. Allen  
Nuclear Waste Technical Review Board (NWTRB)

**Opening Remarks**  
John E. Cantlon  
Chairman, NWTRB

## **Overview and Intent of the Workshop**

Edward J. Cording, NWTRB

### **Wednesday, November 4, 1992 - continued**

Session 1 begins with an introductory presentation that will briefly review the baseline configuration, construction sequence, cost, and schedule for the ESF. This will be followed by a short presentation of the proposed FY 1993 plans for proceeding with the development of the ESF. The round-table discussion follows, with active participation by all attendees encouraged.

#### **Baseline Configuration**

William Simecka, Department of Energy (DOE)

- ESF preliminary design
- Phased approach to implementing the baseline configuration
- Baseline cost and schedule

#### **FY 1993 Approach for Developing the ESF**

Carl Gertz, Yucca Mountain Site Characterization

Project Office (YMPO)

- FY 1993 Yucca Mountain Project \$244.7M budget
- Early access to the underground

#### **Round-table Discussion**

Given reduced budgets, what strategies can be defined to allow the construction of the baseline configuration, and surface and underground site-characterization programs to proceed toward the goal of early determination of site suitability and efficient ESF development?

Approaches to constructing the baseline configuration (layouts, methods, phasing, costs, and schedules) for:

- Portals, surface facilities, site preparation
- Ramps and access drifts to main test level
- Access to Calico Hills and other levels
- Excavation of side drifts and tunnel enlargements
- Constraints on construction of the ESF/proposed repository site: organics, concrete, shotcrete, grouts, water, potential for subsidence
- Nuclear weapons testing facility construction standards applied to the ESF
- Utilities (power lines, vent line, fire/water line, cable trays, etc.)
- Safety codes

Alternatives strategies for developing the ESF:

- Maximizing use of tunnel boring machines
- Size and turn radius of access tunnels
- Geometry and location of alcoves
- Excavating alcoves and turnouts

**Wednesday, November 4, 1992 - continued**

- Ventilation requirements
- Excavation slopes, mucking, and transportation
- Construction of separate access to the Calico Hills formation

*KEY PARTICIPANTS:*

*Carl Gertz, YMPO*

*Thomas Statton, Woodward/Clyde, Management & Operations (M&O)*

*Thomas Blejwas, Sandia National Laboratories*

*Neil Dahmen, The Robbins Company*

*Lok Home, Boretac, Inc.*

*James Friant, Colorado School of Mines*

*Joseph Sperry, NWTRB consultant*

*Hugh Cronin, NWTRB consultant*

*S.H. Bartholomew, NWTRB consultant*

**11:45 A.M. LUNCH**

**12:45 P.M. Overview of Session 2 - Exploration and Testing**

A key part of the ESF development strategy is the definition of what early exploration and testing are needed, and how the ESF can best be used to accomplish key elements of the site-suitability and site-characterization programs. The session will start with a presentation on integrated testing evaluation, followed by a presentation on the need for an alternative testing facility and its functions. Round-table discussion by all workshop participants will then explore the proposed tests to be conducted in the ESF and their relevance to the issue of early assessment of site suitability.

**Integrated Testing Evaluation**

Russ Dyer, DOE

- Early testing priorities

**Why an Alternative Testing Facility?**

William Simecka, DOE

- Thermal testing
- Excavation testing

## **Round-table Discussion**

Testing to be conducted in the ramps, alcoves, main test level, and in Calico Hills formation

- What are we testing for?
  - Regulatory compliance?
  - Scientific confidence through exploration?
  - Scientific confidence through testing?

### **Wednesday, November 4, 1992 - continued**

- What should be the early, high priority objectives for observation or testing in the ESF?
- What are the testing priorities and requirements for:
  - observations across faults?
  - observations across lithologic boundaries?
  - observations in ramps and drifts?
  - testing in alcoves?
  - underground drilling and testing?
  - main test level activities?
- Can the tunnel boring machine be advanced through the ESF without delays for testing?
- How can a balance between surface-based and underground testing be maintained?
  - Where does required testing in deep, dry drillholes fit in?
  - Can the ESF be used for tests that were formerly part of the surface-based program?
- What should be the timing of access to the Calico Hills?
- Should there be direct access to Calico Hills outside the geologic repository operational area?
- Should early access to Pah Canyon be considered?
- What are the constraints on construction of the ESF/proposed repository site in terms of organics, concrete, shotcrete, grouts, water, and potential for subsidence?

#### ***KEY PARTICIPANTS:***

*William Simecka, DOE*

*Russell Dyer, DOE*

*Uel Clanton, DOE*

*Lawrence Hayes, U.S. Geological Survey*

*Thomas Statton, Woodward/Clyde (M&O)*

*Scott Sinnock, TRW (M&O)*

*Ned Elkins, Los Alamos National Laboratory*

*Dale Wilder, Lawrence Livermore National Laboratory*  
*Thomas Blejwas, Sandia National Laboratories*

**6:00 P.M. RECESS**

**Thursday, November 5, 1992**

**8:00 A.M. Overview of Session 3 - Management and Acquisition Strategies**

This session is directed toward a review of the process of design, construction, construction management, contract type, and possible alternative means of obtaining an early delivery of construction at minimum cost. The session opens with a short presentation explaining the current process being used at Yucca Mountain in terms of roles, responsibilities, and authority.

**The Yucca Mountain ESF Design and Construction Program - Management and Implementation**

William Simecka, DOE

**Round-table Discussion**

Alternative management and acquisition strategies

- Roles, responsibilities, and authority
- Equipment and material acquisition, mark-ups
- Fixed price contracts, cost reimbursable contracts, target cost/schedule incentive fees, award fees
- Disputes review board

*KEY PARTICIPANTS:*

*Carl Gertz, YMPO*

*William Simecka, DOE*

*James Allen, Morrison-Knudsen, M&O*

*Robert Pritchett, Reynolds Electrical and Engineering Co.*

*Dale Frasier, Reynolds Electrical and Engineering Co.*

*Joseph Sperry, NWTRB consultant*

*Hugh Cronin, NWTRB consultant*

*Robert M. Matyas, NWTRB consultant*

*S. H. Bartholomew, NWTRB consultant*

**11:45 A.M. LUNCH**

**12:45 P.M. Overview of Session 4 - The Design and Construction of ESF Alternative Scenarios and Strategies**

The purpose of this session is to seek definition or direction on promising strategies for development of the ESF. Integration of construction, testing, and management strategies is emphasized in this wrap-up discussion. All workshop attendees are encouraged to take part.

**Thursday, November 5, 1992 - continued**

**Round-table Discussion**

- Are there promising alternative strategies to developing the ESF?
- What are the implications of the testing requirements vs. constructibility, cost, and schedule?
- Can the excavation process be implemented without delay for testing?
- What is the impact of repository design evolution on the ESF design in terms of planning for changes in location and size of potential repository excavations?
- Is there a precedence for the government buying a tunnel boring machine, then asking a contractor to build a tunnel using an award fee type contract?
- What are the incentives for the contractor to perform?
- Are there alternative strategies for acquisition of underground construction?
- What are the constraints on construction of the ESF/proposed repository site in terms of organics, concrete, shotcrete, grouts, water, and potential for subsidence?

*KEY PARTICIPANTS:*

*All workshop attendees*

**6:00 P.M.      ADJOURNMENT**