YUCCA MOUNTAIN PROJECT

Studies

Repository Layout, Design, Construction Sequence/Waste Emplacement

Presented to:
Nuclear Waste Technical Review Board

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Discussion Topics

- **Controlling design assumptions/factors**
- **Layout**
- **Repository excavation/emplacement sequence**
- **ECRB cross-drift/repository interface**

Controlling design assumptions/ Decision process/Analysis

Controlling Design Assumptions/ Decision Process

Factors influencing the subsurface design include:

- **Geologic setting**
- **Waste inventory heat output, and areal thermal loading**
- **Waste package physical characteristics**
- **Waste package transport and handling system**
- **Desire to maximize use of mechanical excavation methods**
- **Post-closure drainage control**
- **Performance confirmation program requirements**
- **Retrievability requirements**

Layout

Siting Considerations

- **At least 200 meters of cover over emplacement areas - (10 CFR 960)**
- **Above the saturated zone - (10 CFR 960)**
- **Minimum of 100 meters above the saturated zone (design assumption)**
- **Avoid major faults to the extent practical (design assumption - guidance from NRC)**
- **Utilize the TSw2 geologic unit (program decision)**

Available upper repository level siting area figure

Available upper repository level siting area figure

Preliminary Repository Layout figure

West-East cross section through Repository siting volume

Construction Sequence

Move ahead of Emplacement sequence figures

Pre-emplacement development figure

Pre-emplacement development figure

Start of simultaneous emplacement & development figure

Simultaneous emplacement & development year 10 figure

Simultaneous emplacement & development year 15 figure

Caretaker figure

Vent chart figure

Emplacement drift figure

ECRB cross-drift/repository interface

Subsurface reposiotry layout for VA design figure

ECRB Cross-Drift/Repository Interface

- **The cross-drift is planned to cross the repository block from northeast to southwest**
- **Its invert is to be a minimum of 15 meters (and a maximum of 20 meters) above the crown of the eventual repository drifts below it**
- **The cross-drift is to be 5 meters in diameter**
- **The cross-drift will have a consistently positive grade from its starting point at the North Ramp to the point where it passes beyond the west edge of the repository block**

ECRB Cross-Drift/Repository Interface

(Continued)

- **The cross-drift can be utilized as part of the Performance Confirmation program**
- **The northeast end of the cross-drift will provide access to the PC drift network, which overlies the emplacement area**
- **The cross-drift and the PC drifts will intersect with the same invert elevation**

ECRB Cross-Drift/Repository Interface

(Continued)

- **Adverse impact to the repository is not anticipated because:**
  - **The cross-drift is arranged to drain by gravity away from the emplacement area**
  - **The vertical separation is sufficient (3+ drift diameters) to preclude formation of unacceptable stresses caused by interaction of the cross-drift and the emplacement drifts**