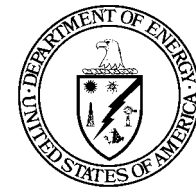


# NWTRB Repository Panel meeting Overview of Design Selection Process

Presented to:  
Nuclear Waste Technical Review Board  
Panel For the Repository

Presented by:  
Richard D. Snell  
CRWMS M&O



U.S. Department of Energy  
Office of Civilian Radioactive  
Waste Management

January 25, 1999

# Overview of Design Selection Process

- **Background**
  - **Repository Design Alternatives Working Group (RDAWG) (12/97-5/98)**
  - **SR/LA Design Alternatives Group (LADS) 6/98 to Present (Completion 5/99)**

**R. D. Snell**  
**Project Manager,  
LA Reference Design**

- D. Thomas, Cost/Schedule Analysis
- F. Afshar, Project Schedule Integration
- K. Coppersmith, Decision Analysis Consultant Support
- T. Cotton, Decision Analysis Consultant Support

- J. Fay, WM&I/Transportation Interface (alternate - G. Vawter)
- E. Hardin, NEPO Interface
- R. Howard, TSPA Interface
- M. Balady, (SE Interface)
- M. Skorska, (EIS Interface)
- M. Gomez, Surface Interface
- D. McKenzie, Subsurface Interface (alternate - R. Saunders)
- T. Doering, WP Interface (alternate - D. Nitti)
- S. Swenning, OQA Interface

- J. Blink, Integrated Design Performance Review
- D. Smith, Materials Performance Review
- B. Kirstein, EBS/Surface Design Perf. Review
- H. Dokuzoguz, Design Features Evaluation
- R. Dulin, Design Alternatives Evaluation
- C. Hastings, Document Manager
- F. Zinkevich, Process Control/Product Integrity
- D. Richardson, Regulatory Interface (alternate - M. Voegele)

# Overview of Design Selection Process

- **Background** (continued)
  - **RDAWG used criteria from 10CFR60 as a starting point; 30+ criteria relevant to alternatives consolidated to a list of 10 directed at technical issues/questions**
  - **RDAWG goal was to develop a diverse group of alternative approaches; A set of five was identified (e.g. thermal loads, ventilation, enhanced access, emplacement mode, waste specific containment / arrangement)**

# Overview of Design Selection Process

- **Background** (continued)
  - **LADS Team started with the RDAWG information**
  - **The list of 10 criteria/issues was expanded to include issues from the TRB, NRC KTIs, TSPA Peer Reviewers, Nye County, DOE and the Repository Consulting Board**
  - **The RDAWG set of five alternative approaches was expanded to eight fundamental alternative designs and 22 individual design features to address the above issues**

# Overview of Design Selection Process

- **Conceptual Design Process**
  - A report prepared for each Design Alternative (DA) and each Design Feature (DF)
  - Reports used to support an Initial Workshop (1/4 - 1/15/99)

# Overview of Design Selection Process

- **Conceptual Design Process** (continued)
  - The January Workshop concluded Phase One of a Two-Phase process
  - Goal of Phase One was to select a set of Enhanced Design Alternatives (EDAs) \* which appear to have merit
- \* EDAs - Basic Repository Configuration Design Alternatives (DAs) with added Design Features (DFs)

# Overview of Design Selection Process

- **Conceptual Design Process** (continued)
  - **Goal of Phase Two is to select a Reduced Set of EDAs, which have been further enhanced/refined**
  - **Using that Reduced Set, a small group of designs with favorable characteristics in performance, licensability, operability and cost can be identified**
  - **A recommendation for SR/LA can then be made (5/99) based on our current understanding of criteria**



# Overview of Design Selection Process

- **Perspectives**
  - This is design work in process
  - Using “Building Blocks” (e.g. DAs and DFs) to build designs
  - This work is at a conceptual and/or very early preliminary level - not final design. Design detail decisions can come later
  - **Balanced evaluations are required:**
    - » Based on comparable levels of detail (available information)
    - » No undue emphasis on more fully developed concepts (e.g. the VA Design is not a candidate)
    - » No overly optimistic expectations on less fully developed concepts

# Overview of Design Selection Process

- **Subsequent Presentations**
  - **Application of Defense-in-Depth (DID) and Performance Assessment (PA) to the design concepts**
  - **Design Concepts for Low Temperature, High Temperature and Enhanced Access Repositories**
  - **Enhanced Access not necessarily an exclusive concept relative to High and Low Temperature concepts**
  - **Many Design Features (DFs) used in the three approaches are not exclusive to one concept (i.e. mix and match can be done)**

# Overview of Design Selection Process

## Design Features

#	Title
01	Ceramic Coatings
02	Drip Shields
03	Backfill
04 & 05	Aging and Blending of Waste
07	Continuous Preclosure Ventilation
08	Rod Consolidation
09	Timing Of Repository Closure
10	Maintenance of Underground Features and Ground Support
11	Drift Diameter
12	Waste Package Spacing and Drift Spacing
13	Waste Package Self Shielding
14	Waste Package CRMs (Metal and Ceramic)
15	Richards Barrier
16 & 17	Diffusive Barrier and Getter under Waste Packages
18	LADS Canistered Assemblies
19	Additives and Fillers
20	Ground Support Operations
22	Near Field Rock Treatment During Construction
23 & 24	Surface Modification – Alluvium and Drainage
25	Repository Horizon
26	Higher Thermal Loading

## Design Alternatives

#	Title
01	Tailored WP Spatial Distribution
02	Low Thermal Load
03	Continuous Post-Closure Ventilation
04	Enhanced Access
05	Modified Waste Emplacement Mode
06	VA Reference Design
07	VA Reference Design w/Options
08	Modular Design / Phased Construction