



Department of Energy
Office of Civilian Radioactive Waste Management
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QA: N/A

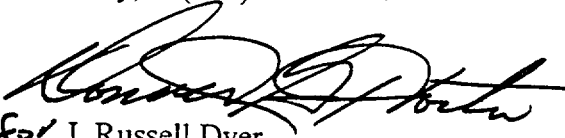
MAR 30 2001

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NOTIFICATION OF POLICY DECISION ON DEFINITION OF FLEXIBLE DESIGN

The Project Operations Review Board (PORB) has approved the enclosed position paper that defines the flexible design of the potential repository that will be available at the time of a site recommendation decision. This definition distinguishes between the elements of the design and operational parameters that can be varied to achieve operational flexibility. Please ensure that everyone within your respective organization is aware of this definition. Documents related to or impacted by this definition that are developed or revised after the approval date of this PORB position paper must be made consistent with this definition.

Questions or requests for further information should be directed to Stephan Brocoum at (702) 794-1359 or his designee, Claudia M. Newbury, at (702) 794-1361.


for J. Russell Dyer
Project Manager

OL&RC:CMN-0944

Enclosure:
PORB Position Paper Number
01-010321-02

cc w/encl:
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PORB POSITION PAPER

Date: 3/21/01

PORB Number: 010321-02

Sponsor: Stephan Brocoun

Statement for Consideration: *A brief description of the decision to be made.*

Approve the following definition of the potential repository design at the time of a site recommendation decision ("flexible design"):

Background – The repository design currently documented in the Project Description Document (PDD), Revision 2, ICN 1, can be operated over a range of thermal conditions, but is described only in terms of higher-temperature operations. A Baseline Change Proposal (BCP) will be initiated to revise the PDD to expressly acknowledge design configuration that can be operated in a lower-temperature mode.

The BCP will serve as the reference to document that the base-line documentation is in a state of change at the time of the release of the Science and Engineering Report (S&ER). Following the release of the S&ER, the base-line reference documentation will be revised and made available for reference in an update to the S&ER expected at the time of the SR decision.

Further refinements to this design to specifically consider a range of operating modes are expected to lead to a flexible design that meets three goals:

1. Provides "preliminary engineering specifications" as the Nuclear Waste Policy Act [NWPA 114(a)(1)(A)] requires in the technical basis for a site recommendation.
2. Describes requirements and design solutions at a level adequate to understand and model engineered barrier performance, effects on the natural system, and total system performance for a site suitability evaluation.
3. Preserves operational flexibility, including operating mode environment, such that further refinements are possible, as additional information becomes available.

Operational and environmental flexibility allows repository operations for various heat loading (i.e., heat sources) and heat removal (i.e., ventilation rates and duration) scenarios. The differences in thermal operating environments include the maximum postclosure temperatures of the waste package surfaces and the emplacement drift walls, the temperatures within the repository host rock, and the humidities in the emplacement drifts. These differences may also have varying effects on coupled thermal-hydro-mechanical-chemical processes within the site. The flexible design, therefore, provides a way to manage these coupled process effects and the associated uncertainties.

The flexible design refers to a set of performance and operational requirements that are common to repository thermal operating modes encompassing a range from lower to higher temperatures.

Repository baseline documents, including the PDD will be revised to more clearly reflect a flexible design that is compatible with the entire range of thermal operating modes.

Flexible Design Definition – Elements of the flexible design include:

- Capability within the Waste Handling Building to blend hotter and cooler commercial spent nuclear fuel assemblies to distribute the heat generation of the waste packages.
- Ability to emplace at least 70,000 MTHM of spent nuclear fuel and high-level radioactive waste.
- Emplacement drifts 5.5-meters diameter, spaced approximately 80 meters apart, in a stable rock mass.
- Waste packages with a corrosion-resistant outer shell (Alloy-22) and structural stainless-steel inner shell to improve overall performance.
- Drip shields of corrosion-resistant titanium over the waste packages to divert seepage away from the waste package.

Operational flexibility is achieved by varying operational parameters, including:

- Ventilation duration and method (forced-air or natural circulation).
- Distance between waste packages to manage heat load.
- Surface aging (or cooling) of hotter commercial spent nuclear fuel to manage the heat output of the waste packages.
- Number of emplacement drifts.
- Heat output per waste package.

This flexible design, which will continue to evolve for license application, will employ a set of operational parameters that will be highly dependent on the thermal characteristics of the waste stream. Because the design is flexible, the operating mode can be based on performance assessment feedback as well as adjusted once the thermal characteristics of the actual waste stream are known. Adjustments can continue based on information acquired during repository licensing, construction, emplacement, and operations.

Recommendation: *A brief statement of the recommended option/alternative and rationale, and rationale for the rejection of other options/alternatives.*

Request PORB acceptance of the recommended definition of Flexible Design

Impact: None. The definition is compatible with the DOE Revised Guidance for Replanning the Fiscal Year (FY) 2001 Annual Update to the Multi-Year Plan dated February 27, 2001.

Estimated Cost: None. The use of the recommended definition will not incur additional costs.

Method of Implementation:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Prepare/Submit Baseline Control Change Request |
| <input type="checkbox"/> | Prepare/Submit Document Change Request |
| <input type="checkbox"/> | Administrative Change |
| <input type="checkbox"/> | Technical Direction Letter |
| <input type="checkbox"/> | Work Authorization (if required) |

Individual Responsible for Implementation: Dennis Williams

Submit to Decision Database:

xx Yes No

Individual Responsible for Submittal to Decision Database : Alma Romero

Concurrence:



PORB Chairman

3/26/01
Date

Decision: Project Manager/Program Director accept or reject recommendation. Include summary statement if necessary.

✓ Accept Reject

Approved by:


Project Manager/Program Director

3/26/01
Date

PORB Sponsor:

PORB Number:

PORB Title:

ATS Title:

Accession Number:

ATS Number:

Keywords: