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WM DOCKET CONTROL
CENTER

'86 AUG 27 5 25 PM DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
OFFICE OF GEOLOGIC REPOSITORIES
CHANGE CONTROL BOARD

~~February 27, 1985~~

FROM: M. P. Hanson, Secretary

TO: Change Control Board Members (By Facsimile)

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WM Record File

101

WM Project 10

Docket No.

PDR ☒

LPDR ☒

Distribution:

REB HJB

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Film: E. Cook - NRE

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A conference call was held on Friday, Feb 15, 1985, in which your representative was consulted about two changes to the Generic Requirements for a Mined Geologic Disposal System (OGR/B-2), BCP B-100 and BCP B-101, which you have already evaluated. In an attempt to resolve your previous comments, new changes were proposed during the conference call. These new changes and revised justifications are being distributed for your further evaluation by this memorandum. Please obtain a Baseline Change Proposal Evaluation Sheet from the OGR Program Baseline Procedures Handbook and return a completed evaluation for each change by March 14, 1985.

Please telecopy your evaluation to:

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PDR WASTE
WM-10 PDR

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**GEOLOGIC REPOSITORY DEPLOYMENT
PROGRAM**

BASILINE CHANGE PROPOSAL

DATE: February 27, 1985

SHEET 1 OF 1

BCP NUMBER B. 100

BCP TITLE Modify definition of Engineered Barrier System

DOCUMENT NUMBER OGR/B-2

REVISION

DOCUMENT TITLE Generic Requirements for a HGDS

ADDITION OF DOCUMENT ☐

CHANGE BASELINED DOCUMENT ☒

DESCRIPTION AND JUSTIFICATION FOR PROPOSED CHANGE:

Modify the definition of Engineered Barrier System to include a portion of the host rock in the system where appropriate.

The NRC has specified a performance objective for the engineered barrier system in 60.113(a)(1)(ii)(B). In most cases, the Project Offices have planned to meet this release rate criterion within the waste package. However, the proposed change provides flexibility to the Project Offices to incorporate a portion of the host rock in the definitions of "underground facility" and "engineered barrier system". However, where the host rock is incorporated into the definition of engineered barrier system for purposes of meeting the release rate criterion, the Project Offices will need to demonstrate the ability to characterize the host rock under anticipated conditions and to predict performance over the period of performance (10,000 years) in order to support a finding of reasonable assurance of compliance by the NRC. This may necessitate inclusion of coupled effects testing in the Site Characterization Plan and the Exploratory Shaft Test Plan.

OTHER BASELINE DOCUMENTS AFFECTED:

None

DETAILS OF IMPACT ACTIVITY/ITEM AFFECTED	COST IMPACT	SCHEDULE IMPACT
Definition Change	Paper work	None

ORIGINATOR

NAME Mark Fred / MFC 2/27/85

ORGANIZATION RW-23

PHONE 252 2322

SUBMITTED BY

SIGNATURE [Signature]

PROJECT

DATE 2/27/85

GEOLOGIC REPOSITORY DEPLOYMENT
PROGRAM
BASELINE CHANGE PROPOSAL

DATE: February 27, 1985

SHEET 1 OF 1

BCP NUMBER B- 101

BCP TITLE add a performance criterion to the Waste Package

DOCUMENT NUMBER NCR/3-2

REVISION

DOCUMENT TITLE Geologic Requirements for a HGPS

ADDITION OF DOCUMENT ☐

CHANGE BASELINED DOCUMENT ☒

DESCRIPTION AND JUSTIFICATION FOR PROPOSED CHANGE:

Change the performance criterion on Engineered Barrier System (Postclosure) to be applicable to the waste package and change the performance criterion related to excluding radionuclide releases at a rate less than 0.1 percent of the calculated total release rate to a rate less than 1 part in 100,000,000. The first change is intended to serve as a goal for waste package design and performance assessment efforts in the near-term. The change is aimed to assure uniformity among the projects in their activities related to the NRC release rate performance objective. This change, coupled with BCP B-100, provides each project the opportunity, if needed, to conduct a tradeoff analysis of either modifying the waste package design to assure compliance with the release rate performance objective or moving the boundary for compliance with the performance criterion back out to the engineered barrier system while taking credit for a portion of the host rock within that system. Changing the boundary for complying with the release rate performance objective back out to the engineered barrier system would require further change control action. The second change improves the clarity of the performance objective, consistent with discussions in the draft EA's.

OTHER BASELINE DOCUMENTS AFFECTED:

DETAILS OF IMPACT
ACTIVITY/ITEM AFFECTED

COST IMPACT

SCHEDULE IMPACT

Definition Change

Paper Change

None

ORIGINATOR

NAME Mark Frei MWF 2/27/85

ORGANIZATION RW-23

PHONE 252-9322

SUBMITTED BY

SIGNATURE *[Signature]*

PROJECT

DATE 2/27/85

DEFINITION:

The emplaced waste form, container, any other packing, and absorbent materials immediately surrounding an individual waste container.

FUNCTIONAL REQUIREMENTS:

1. To contain the radionuclides for a specified period of time.
2. To contribute to controlling the release of radionuclides after the containment period.

PERFORMANCE CRITERIA:

1. The waste package system shall be designed, assuming anticipated processes and events, so that containment of radioactive waste will be substantially complete for a period not less than 300 years after permanent closure of the geologic repository. Specific numeric criteria for "substantially complete" and the time period for containment depend on site-specific characteristics (10 CFR 60.113(a)(1)(ii)(A) and 60.113(b)).

- ~~2. The specific performance criteria for controlling the release of radionuclides from the waste package will be a site-specific determination.~~

2. The waste package system shall be designed, assuming anticipated processes and events, so that the total release rate of any radionuclide from all of the waste packages* after the containment period shall not exceed (a) 1 part in 100,000 per year of the inventory of that radionuclide calculated to be present at 1000 years after permanent closure or (b) 1 part in 100,000,000 per year of the total inventory of radionuclides calculated to be present at 1000 years after permanent closure. The total release rate is to be calculated based on the total population of waste packages, and not for an individual waste package.

*The engineered barrier system performance objective of 10CFR60.113 is being applied to the waste package as a goal for design and performance assessment purposes at this time.

- Subparts are: 2.2.1 WASTE PACKAGE
2.2.2 REPOSITORY ENGINEERED BARRIERS
2.2.3 SHAFT AND BOREHOLE SEALS

DEFINITION:

Any permeable material or structure that prevents or substantially delays movement of water or radionuclides.

FUNCTIONAL REQUIREMENTS:

1. To control the release of radionuclides into the geologic setting.

PERFORMANCE CRITERIA:

1. a. Assuming anticipated processes and events, the release rate of any radionuclide from the engineered barrier system, excluding shaft and borehole seals, following the containment period shall not exceed 1 part in 100,000 per year of the inventory of that radionuclide calculated to be present at 1,000 years following permanent closure or such other fraction of the inventory as may be approved or specified by the Commission; provided, that this requirement does not apply to any radionuclide which is released at a rate less than 0.1 percent of the calculated total release rate limit. The calculated total release rate limit shall be taken to be one part in 100,000 per year of the inventory of radioactive waste, originally emplaced in the underground facility, that remains after 1,000 years of radioactive decay (10 CFR 60.113(a)(1)(ii)(B)).
- b. Shaft boreholes and their seals shall be designed to ensure that release of radioactive materials to the accessible environment following permanent closure conforms to such generally applicable environmental standards for radioactivity as may have been established by the EPA with respect to both anticipated processes and events and unanticipated processes and events (10 CFR 60.112).

CONSTRAINTS:

- A. The engineered barrier system must be designed such that other components of the repository such as shafts and drifts do not eventually become ground-water flow paths and do not promote the release of radionuclides to the accessible environment.

Definition:

Any material or structure that prevents or substantially delays movement of fluids or radionuclides. This material or structure will generally be manmade, but may include a portion of the host rock.