

Mr. Dwight E. Shelor, Associate Director  
 for Systems and Compliance  
 Office of Civilian Radioactive Waste Management  
 U.S. Department of Energy  
 1000 Independence Avenue, SW  
 Washington, DC 20585

3.10.1993

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Dear Mr. Shelor:

SUBJECT: COMMENTS ON THE MAY 28, 1993, VERSION OF "MINED GEOLOGIC DISPOSAL SYSTEM (MGDS) ANNOTATED OUTLINE SKELETON TEXT FOR THE PREPARATION OF A LICENSE APPLICATION, REVISION 2"

The staff of the Nuclear Regulatory Commission has reviewed the May 28, 1993, version of the Department of Energy's (DOE's) "Mined Geologic Disposal System (MGDS) Annotated Outline Skeleton Text for the Preparation of a License Application, Revision 2," (AO), and has one general observation and several specific comments. The general observation is provided below. The specific comments are included as Enclosure 1. Enclosure 2 contains the staff's evaluation of the DOE response to two staff comments on the September 30, 1992, version of the AO.

NRC has recently published in the Federal Register, a proposed rule (58 FRN 130, pp. 36902-36905), clarifying the requirements in 10 CFR Part 60 for the investigation and evaluation of siting criteria and their relationship to the post-closure performance objectives. In particular, this proposed rule clarifies existing NRC policy on the need to consider conditions of the natural system in combination with other characteristics of the site and design when assessing the ability of a site to meet the post-closure performance objectives. The staff believes that its intent, as well as the long-standing NRC policy in this regard, is explained in the Federal Register and that DOE should consider this in future versions of the AO.

The staff's specific comments deal with new or revised information provided in the May 28th, 1993, version of the AO in the areas of Total System Performance and Performance Confirmation.

If you have any questions about the staff's review of the AO, please contact Mark Delligatti of my staff. Mr. Delligatti can be reached (301) 504-2430.

Sincerely,

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Joseph J. Holonich, Director  
 Repository Licensing and Quality  
 Assurance Project Directorate  
 Division of High Level Waste Management  
 Office of Nuclear Material Safety  
 and Safeguards

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Enclosures: As stated

cc: See next page

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NAME	MDelligatti		RJohnson		JHolonich				
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Mr. Dwight E. Shelor

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cc: R. Loux, State of Nevada  
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**ENCLOSURE 1**

**SPECIFIC COMMENTS ON JUNE 28, 1993, VERSION OF DOE'S A0**

## COMMENT 1

Potentially adverse conditions may not be appropriately considered in demonstrations of compliance with the overall system performance objectives.

BASIS

- In Section 6.5.2.2, "Incorporation of Potentially Adverse Conditions into Processes and Events," it is stated that "the potentially adverse conditions were incorporated into appropriate processes and events ... and were modeled individually where possible or were incorporated into scenarios."
- The discussion in the AO should reflect that the effects on repository performance of any potentially adverse condition determined to be present should be examined in the context of other characteristics of the site and design as well.

RECOMMENDATION

The discussion in the AO should reflect that the effects on repository performance of any potentially adverse condition determined to be present should be examined in the context of other characteristics of the site and design as well.

**COMMENT 2**

It appears that consideration of the effects of favorable conditions and potentially adverse conditions determined to be present may be inappropriately restricted to scenario development.

**BASIS**

- The headings for Section 6.5.1.3, "Incorporation of Favorable Conditions into Scenarios," and Section 6.5.2.3, "Incorporation of Potentially Adverse Conditions into Scenarios" imply that the effects on repository performance of favorable conditions and potentially adverse conditions determined to be present will be restricted to consideration only through incorporation of these conditions into scenarios.
- On page 6-6 of the NRC's Draft Regulatory Guide DG-3003, "Format and Content for the License Application for the High-Level Waste Repository," under Sections 6.5.1, "Favorable Conditions," and 6.5.2, "Potentially Adverse Conditions," it is stated that discussions, with respect to any of these conditions determined to be present at the site, should describe how each condition has been incorporated into either a conceptual model or a scenario.
- The staff considers that the impacts of certain favorable conditions (e.g., geochemical conditions promoting precipitation or sorption of radionuclides) and potentially adverse conditions (e.g., oxidizing groundwater conditions) on repository performance could be more appropriately considered through incorporation into conceptual models and/or consequence models rather than only into scenarios.

**RECOMMENDATION**

Discussion in the AO should allow for the possibility that the effects on repository performance of favorable conditions and potentially adverse conditions be considered through incorporation into conceptual and consequence models rather than only into scenarios.

**REFERENCES**

U.S. Nuclear Regulatory Commission, November 1990, "Format and Content for the License Application for the High-Level Waste Repository," Draft Regulatory Guide DG-3003, issued for public comment November 1, 1990.

Section 6.5            10 CFR Part 60 Criteria

COMMENT 3

It is not clear how the favorable conditions and potentially adverse conditions identified in Section 6.5 of the AO are related to the favorable conditions and potentially adverse conditions of 10 CFR 60.122.

BASIS

- Under Section 6.5.1, "Favorable Conditions," two examples of favorable conditions are offered: (1) retardation of radionuclides by the mineralized layers along flow paths to the accessible environment and (2) control of radioactive gases by thin nearly saturated zones between the ground surface and the repository. These explicit examples are not favorable conditions under 10 CFR 60.122(b).
- In Table 6.5B, "Summary of Potentially Adverse Conditions," fracture flow is offered as an example. Fracture flow is not a potentially adverse condition under 10 CFR 60.122(c).

RECOMMENDATION

Discussion in Section 6.5 of the AO of the favorable conditions and potentially adverse conditions should be formatted such that the relationship with the favorable conditions and potentially adverse conditions of 10 CFR 60.122 is made clear.

**Section 8.1.1 Performance Confirmation for the Geologic System**

**COMMENT 1**

The seismic network monitoring and geodetic leveling programs as identified in Section 8.1.1, Table 8.1A - Performance Confirmation Tests for the Geologic System - do not appear to include the controlled area.

**BASIS**

- Table 8.1A (Performance Confirmation Tests for the Geologic System), seismic network monitoring and geodetic leveling confirmation tests specifically include monitoring the region, but fails to mention monitoring the controlled area.

**RECOMMENDATION**

Performance confirmation tests identified in Section 8.1.1 (Table 8.1A), specifically the seismic network and geodetic leveling programs, should consider including monitoring of the controlled area.

**ENCLOSURE 2**

**NRC STAFF EVALUATION OF DOE RESPONSES TO  
COMMENTS ON SEPTEMBER 30, 1992, VERSION OF DOE'S AO**



Section 6.2.2 "Potentially Disruptive Processes and Events"  
Section 6.2.3 "Processes and Events for Undisturbed Performance"

COMMENT 1

The AO does not appear to reflect appropriate consideration of a full range of possible occurrences of potential processes and events and their effects on post-closure overall repository system performance.

**EVALUATION OF DOE RESPONSE**

- o In the transmittal letter for AO Revision 2 (Shelor to Holonich, dated May 27, 1993), DOE stated that Tables 6.2H and 6.2S were modified by adding Information Needs INN 6.2-007 and INN 6.2-006, respectively, to indicate that these tables are considered to be incomplete.
- o Additionally, DOE considers that, given the information supplied through INN 6.2-007 (called for by December 1994), its performance assessment capability will be mature enough at that time to complete Table 6.2H. A similar situation is expected for Table 6.2S, which may be completed based on the information supplied by INN 6.2-006 (called for by December 1993). A decision by DOE as to the completeness of these tables will be made once the Information Needs become available and the information is incorporated into the AO. If it is determined that the tables are incomplete, DOE states that additional information needs will be added.
- o Based on the addition by DOE of the two Information Needs in recognition that these tables are currently incomplete, the NRC staff considers this comment resolved. However, the staff may reopen this comment in the future if it appears that an incomplete set of disruptive processes and events, their locations and potential effects will be considered in the compliance demonstration for the overall repository system performance objectives.

Section 6.2.2 "Potentially Disruptive Processes and Events"  
Section 6.2.3 "Processes and Events for Undisturbed Performance"

COMMENT 2

Pre-closure concerns are offered as examples of potential effects of processes and events on post-closure performance of the overall repository system.

**EVALUATION OF DOE RESPONSE**

- o In the transmittal letter for AO Revision 2 (Shelor to Holonich, dated May 27, 1993), DOE stated its agreement that the examples provided in the Form 2 Planning Package were inappropriate.
- o The DOE has modified the format of the AO presentation in Revision 2, and in doing so, has eliminated the AO Planning Packages, which corrected the error.
- o The NRC staff considers this comment resolved.