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Mr. W. Wade Ballard, Director
Division of Waste Repository Development
NE-22 (GTN)
U. S. Department of Energy
Washington, DC 20545

Dear Mr. Ballard:

We have completed our review of the draft document entitled "NwTS Program Criteria for Mined Geologic Disposal of Nuclear Wastes: Repository Performance and Development Criteria, DOE/NwTS-33(3)." Our review focused on the adequacy of the criteria presented in the document and the completeness of the document in addressing repository design and performance requirements. Our specific comments are attached.

The document is general in nature and few definitive criteria for repository performance and development are specified. The final document should acknowledge that the criteria and requirements presented must eventually be in conformance with the final rule 10 CFR Part 60. In his statement to the Commission on November 18, 1982, Dr. Coffman stated that DOE was in agreement with all parts of the rule except the performance objectives for individual barriers and that DOE believed these other portions of the rule should be promulgated. We believe that to the extent practical, the DOE programmatic criteria should reflect those portions of NRC's regulations now in order to avoid future program delays. Most of our specific comments address what we view as differences between the criteria presented in your document and our proposed 10 CFR Part 60 requirements.

In view of the repeated references to transuranic radioactive wastes (TRU) in the document, it should be noted that 10 CFR Part 60 does not address TRU. In addition, the criteria which relates to the performance confirmation program, required by 10 CFR Part 60, should be presented in the final document.

We appreciate having the opportunity to review and comment on the draft document. It is hoped that our comments will be of assistance in the

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development of the final repository criteria. Members of my staff are available to discuss these comments with you or members of your staff, if you desire.

Sincerely,

ORIGINAL SIGNED BY

Michael J. Bell, Chief
High-Level Waste Licensing
Management Branch
Division of Waste Management

Enclosure:
As stated

*See previous concurrence.

*revised/REB
12/1/82*

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We appreciate having the opportunity to review and comment on the draft document. It is hoped that our comments will be of assistance in the development of the final repository criteria. Members of my staff are available to discuss these comments with you or members of your staff, if you desire.

Sincerely,

John B. Martin, Director
Division of Waste Management

Enclosure:
As stated

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**Comments on
NWTS Program Criteria for Mined Geologic
Disposal of Nuclear Waste: Repository Performance
and Development Criteria, DOE/NWTS-33(3)**

**By
Division of Waste Management
November 1982**

1.0 Introduction

1. Repository performance and development criteria should be consistent with the requirements of the final 10 CFR Part 60 regulation. This should be emphasized in the second paragraph on page 1.

2.0 Background

1. Monitoring the system performance does not contribute to the containment and isolation capabilities of the repository as stated in the first paragraph (#3) on page 6.
2. In the first paragraph on page 7, it is stated that "adequate isolation will be achieved for at least 10,000 years with no prediction of unacceptable decrease in isolation beyond that time." This concept is too vague to be useful without a definition of "unacceptable decrease."
3. The quality assurance program, discussed in the third paragraph on page 7, applies to all systems, structures and components important to safety, and should also address activities such as site characterization, facility operations, performance confirmation, permanent closure, and decontamination and dismantling of surface facilities.

3.0 Repository Performance Criteria

1. Section 3.4 on page 9 should ultimately reference the final 10 CFR Part 60 requirements for containment and release rates.

4.0 Repository Development Criteria

1. In Section 4.1.3 on page 10, it is proposed to design the repository to "... include measures to limit the likelihood of future human interference with the repository." It is not clear how that portion of the repository which is below ground can be designed to limit the likelihood of human interference with it.
2. The term "if necessary," in Section 4.1.4 (line 4), should be deleted. Provisions for the capability to retrieve waste until the completion of a performance confirmation program and a Commission decision regarding permanent closure will be required by 10 CFR Part 60.
3. In Section 4.2.1 on page 12, under the topic "Fires and Explosions," it should be noted that systems important to safety shall not only be designed to withstand fires and explosions, but also be able to continue to perform their safety functions.
4. The requirements of 10 CFR Part 20 should be referenced as criteria for occupational radiation exposure control in Section 4.2.2 on page 13.

5. In Section 4.2.3 on page 13, the stated requirements should apply to the entire repository operations area and not only the surface facilities.
6. The hoisting system criteria (Section 4.2.7, page 14) should also address 10 CFR Part 60 requirements for a cage location system, loading and unloading system interlocks, and indicators noting when canisters are in place and ready for transfer.
7. For criticality control, discussed in Section 4.2.8 (pages 14-15), include 10 CFR Part 60 requirements for the calculated effective multiplication factor.
8. The requirements of 10 CFR Part 60 should be addressed for protection against the adverse effects of operation or failure of the fire suppression systems discussed in Section 4.3.2 (pages 15-16), to the extent that all structures, systems, and components important to safety can perform their intended functions.
9. In Section 4.3.5 (page 16), the first sentence is not clear and should be reworded.
10. The occupational safety program, discussed in Section 4.3.7 (page 17), should include proficiency testing, certification, and requalification of operating and supervisory personnel involved in operations important to safety.
11. In Section 4.3.8 on page 17, it should also be stated that the underground facility shall be designed so that the effects of

credible disruptive events during the period of operations, will not spread through the facility.

12. Section 4.4, "Long-Term Containment and Isolation," on page 18, should reference the corresponding performance criteria in Section 3.4 of the document.
13. Criteria for development methods (Section 4.4.1., page 18) should also address 10 CFR Part 60 requirements for capability to adjust the design for in-situ conditions and for the control of water and gas intrusion.
14. The potential for creating preferential pathways and not only rock fracturing should be addressed in Section 4.4.2, criteria for excavation (page 18).
15. The document indicates that backfilling should be used to mitigate subsidence of the ground surface (Section 4.4.2, page 19). Ground subsidence per se is not an issue in long-term containment and isolation; the issue is the amount of strain and probably fracturing that would have to take place at or near the repository horizon to have surficial subsidence. The strain and fracturing does have containment and isolation significance.
16. Models, discussed in Section 4.4.3, #2 on page 20, should support the development of design specifications rather than "... be used to develop ..." design specifications. This paragraph appears to place undue emphasis on the use of models in light of current limitations of thermomechanical modeling.

17. The statement in Section 4.4.4, #2, on page 21, should be clarified. If subsurface activities are permitted within 10 km of the repository they will consistute part of the accessible environment according to the most recent draft of the EPA standard.
18. In Section 4.5, "Operations" (page 22), the treatment of radioactive wastes generated at the repository operations area should also be addressed.
19. The third sentence in Section 4.5.9, "Retrieval" (page 25) should read "The capability to initiate retrieval ..." to be consistent with 10 CFR Part 60.
20. In Section 4.5.9, bullet #2 on page 25, it should be stressed that provisions for retrieval both during and after the initial verification period must conform to the retrieval requirements of 10 CFR Part 60.

It is stated (bullet #3) that during emplacement of the waste the repository system will be monitored for an initial period of five years to confirm repository performance. 10 CFR Part 60 will require monitoring throughout the emplacement period.

21. A slower paced retrieval period, discussed in Section 4.5.9, bullet #6 on page 26, may be preempted by the design of subsurface openings.
22. In Section 4.5.10.3 on page 27, it is stated that the burden of accountability for the nuclear waste material should rest with the

generator. It seems that such a blanket statement indicates that accountability is still required of the generator after delivery of the waste to the repository has been completed. A more reasonable plan would be for accountability to be transferred to the repository operator once the contents of a waste package have been delivered and verified.

23. The issue of backfill as a part of the rock support system is confused in Section 4.6.1, bullet #1 (page 28). It is implied that backfill can be used to mitigate stress and strain in plastic rocks. Two points are important: (1) Under repository conditions virtually all rocks will exhibit time dependent strain with some thermal component, in fact fractured brittle rock may behave worse than plastic rock and, (2) if rock is behaving plastically, other rock support systems could be necessary before the backfill could be emplaced.
24. In Section 4.6.1 (first bullet at top of page 29), it should be defined whether a high or low potential for expansion is a desirable property.
25. Relative to Section 4.6.2, #1 on page 29, more research and development is needed to determine if seals whose integrity can be assumed for more than about 100 years can be formed. The goal stated in this paragraph that "seals must maintain their integrity throughout, and as far beyond the thermal period as is reasonably achievable, ..." is probably unrealistic. A waste disposal system which relies on such seals to properly isolate wastes therefore may be unachievable.

26. The last two sentences in #2 under Section 4.6.2 (page 29) appear to be inconsistent.

27. The decision on the need for maintenance of ownership control of the buffer zone (Section 4.6.4, last sentence on page 32), should be made during processing of a Construction Authorization application and reviewed during processing of an application to decommission. If this decision were deferred until the completion of decommissioning, DOE might well be faced with the alternatives of acquiring a substantial amount of land or deferring decommissioning indefinitely, both of which could be very costly.

References

1. The latest published version of the proposed rule 10 CFR Part 60 should be referenced.