

U.S. NUCLEAR REGULATORY COMMISSION  
AVAILABILITY OF DRAFT TECHNICAL POSITION ON  
POSTCLOSURE SEALS IN AN UNSATURATED MEDIUM

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Availability.

SUMMARY: The Nuclear Regulatory Commission (NRC) is announcing the availability of the "Draft Technical Position on Postclosure Seals in an Unsaturated Medium."

DATE: The comment period expires (insert the date 60 days after publication).

ADDRESSES: Send comments to John J. Linehan, Acting Chief, Project Management and Quality Assurance Branch, Division of High-Level Waste Management, U.S. Nuclear Regulatory Commission, Mail Stop 4-H-3, Washington, D.C. 20555. Copies of this document may be obtained free of charge upon written request to Marlene Creviston, Project Management and Quality Assurance Branch, Division of High-Level Waste Management, U.S. Nuclear Regulatory Commission, Mail Stop 4-H-3, Washington, D.C. 20555, Telephone 1/800/368-5642, Ext. 20440.

FOR FURTHER INFORMATION CONTACT: Brian Thomas, Project Manager, Project Management and Quality Assurance Branch, Division of High-Level Waste Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Telephone 301/492-0433.

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SUPPLEMENTARY INFORMATION: The U.S. Nuclear Regulatory Commission has prepared a draft version of a Technical Position (TP) on site sealing in an unsaturated medium. Previously, the NRC issued a TP entitled "Generic Technical Position on Borehole and Shaft Sealing of High-Level Nuclear Waste Repositories" (NRC, 1986) which focused mainly on issues related to repositories in saturated media. However, the Department of Energy (DOE) is currently investigating the unsaturated Yucca Mountain site for detailed characterization. Although the guidance in the existing TP is also applicable to repositories in unsaturated media, DOE's current design concepts include a combination of sealing and drainage, and the NRC staff position on this concept is not adequately discussed in the original TP. Therefore, additional guidance is needed to clarify the NRC staff position on sealing and drainage for a repository in an unsaturated medium. The purpose of this technical position is to provide guidance with respect to sealing concepts as described in recent DOE publications (Case and Kelsall, 1987; Fernandez, 1985; Fernandez and Freshley, 1984; Fernandez et al., 1987).

In general, the revised TP discusses the need to evaluate seals in an unsaturated medium. The principal design goals given in the TP include: (1) prevention of significant amounts of surface or ground water from reaching emplaced waste; and (2) prevention of significant amounts of gaseous radionuclides from escaping through shafts, ramps, and boreholes to the accessible environment. In establishing the NRC staff positions presented in this document, the staff has recognized that large uncertainties are likely to persist in evaluating the longevity and long-term effectiveness of seals and

drainage for the postclosure period. In view of these uncertainties, the staff considers it prudent to minimize the need for seals wherever feasible. These considerations suggest that the number of surface openings be limited, and their locations be selected to discourage infiltration of surface water.

This technical position provides guidance regarding design considerations for seals of shafts, ramps, boreholes, and the underground facility. It should be noted that the criteria for seals given in Part 60 of Title 10 of the Code of Federal Regulations (10 CFR Part 60) do not specifically mention seals in ramps and the underground facility. However, because the seals and drainage design in ramps and the underground facility could also affect the overall system performance of the geologic repository, it is reasonable to apply the same guidance to these seals and drainage designs.

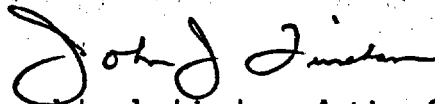
In addition, the TP takes into account site characterization and performance confirmation testing, including the need for starting in situ seal testing during site characterization and for confirming the adequacy of seal and drainage concepts, emplacement methods, and material compatibility. In addition, this technical position emphasizes the need for considering the effects of seals and/or drainage design on meeting the overall system performance requirements.

Not explicitly addressed in the TP are the implications of potential changes in water level during the postclosure period. However, it is expected that sealing performance analyses and requirements will include adequate consideration of credible future tectonic, geologic, geomorphological, and geochemical processes and events that could affect seal performance.

Technical positions describe and make available to the public criteria for methods acceptable to the NRC staff for implementing specific parts of the Commission's regulations or otherwise provide guidance to the DOE. Technical positions are not substitutes for regulations, and compliance with them is not required. Methods and solutions not in accordance with criteria set out in the position will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Dated at Rockville, Maryland, this 21<sup>st</sup> day of September 1988.

FOR THE NUCLEAR REGULATORY COMMISSION



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