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December 24, 1984

Mr. Hubert J. Miller, Chief  
Repository Projects Branch  
Division of Waste Management  
U.S. Nuclear Regulatory Commission  
Mail Stop 623-SS  
Washington, D.C. 20555

Dear Mr. Miller,

The following comments represent our review of the "Draft Generic Technical Position on In Situ Testing During Site Characterization for High-Level Nuclear Waste Repositories." We appreciate the opportunity to offer you our comments, which have been divided into general and specific categories, and we hope you find them useful.

Sincerely,

*Tom Kalitowski*

Tom Kalitowski, Chairman  
Governor's Task Force on High-Level  
Radioactive Waste

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STATE OF MINNESOTA

Comments on Draft Generic Technical Position on In-Situ  
Testing During Site Characterization for High-Level  
Nuclear Waste Repositories

December 24, 1984

General Comments:

- 1) We agree that the in situ test plan should discuss how data from long duration tests will be used in the repository design. This is an important, often overlooked aspect of the design process. Because schedules drive the program, the design will be complete well in advance of long-term testing. Therefore, we support the guidance given in this paragraph (page 17, Section 4.5 - Duration of Testing).
- 2) We also support the NRC with respect to Section 4.10 - Presentation and Documentation of Test Data. Independent review is a critical issue to States and Tribes in the licensing process. To date, much work has been done by DOE to inhibit or prevent the affected parties from doing any independent analyses with available data. Adherence by DOE to the guidance presented by NRC in this section would be very useful in correcting this situation.
- 3) The idea of "sufficiency criteria" is interesting and very important. Although the NRC seems to be guiding DOE towards the testing of coupled effects, there is no solid criteria on which the adequacy of characterization can be assessed. The idea of weights for various components has merit; however, as expressed, it may result in little or no testing being done to verify assumptions made regarding these individual components.

The NRC should initiate a rigorous study on the various causes of uncertainty and find out exactly what can be done to minimize uncertainty, especially in interscale transfer of information. The idea of sufficiency would then become more straightforward and some substantial criteria for minimization could be written.

- 4) The discussion of uncertainty on page 9, first paragraph, and the page 24 graph of uncertainty are misleading. The NRC is really saying that with sufficient testing at a given scale, some confidence eventually will be attained for certain parameters. However, given the time frames of both laboratory and in situ testing, it would be extremely unlikely (if not impossible) for uncertainty in performance assessment to ever become asymptotic. It is therefore requested this graph be removed or revised; the uncertainties involved in performance compliance with 10 CFR 60 would best be represented as an exponential curve.

Specific Comments:

Page 10, #1

Size Effects Can be Minimized

This would be more appropriately called scale effects, and should be changed accordingly.

Page 11, 3.2.1

"Establishing the information needs for License Application based on performance requirement, and the acceptable level of uncertainties in repository performance prediction."

Mathematical uncertainty is a quantity that increases dramatically (exponentially) over the various scales in which the laboratory and in situ test data must be extrapolated. How will an "acceptable level" of uncertainty be identified for performance prediction? This paragraph should be expanded to require a rigorous approach to mathematical uncertainty especially with regard to interscale transfer of information.

Page 13, 3.2.1 B(3)

"Determination of hydrologic parameters of the host rock, such as....."

The in situ testing should also include studies of adjacent hydrologically significant units. For instance, if a major aquifer or set of aquifers overlies or underlies the host rock, the potential for flow to enter these units from the host rock is a critical element which must be assessed. In situ hydraulic parameters can be easily obtained for these units either thru the shaft of the underground facility. This requirement should be explicitly stated in the referenced paragraph.

Page 15, 4.4.

Scale of Testing:

"One aspect of scale was expressed by NRC in the supplementary information to the procedural rule 10 CRF 60, that a facility consisting of two exploratory shafts and 1,000 feet of tunnels would be a practical arrangement....."

It is agreed the scale of testing must be site dependent to reflect the scale of nonhomogenities encountered in the rock. However, the need for two shafts at all full scale test locations may not be warranted from the scientific point of view (safety aside). For example, in an unsaturated zone repository, two shafts may speed the drying of the in situ facility and cause hydrologic test information to be misleading. The current language implies that NRC wants two shafts at all large scale test locations; this language should be corrected.