



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

January 24, 1992

The Honorable Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Selin:

SUBJECT: NRC STAFF TECHNICAL POSITION ON "THE IDENTIFICATION OF
FAULT DISPLACEMENT AND SEISMIC HAZARDS AT A GEOLOGIC
REPOSITORY"

During a meeting of a working group of the Advisory Committee on Nuclear Waste (ACNW) on December 17, 1991, and during the 38th meeting of the ACNW on December 18-19, 1991, the staff of the Office of Nuclear Material Safety and Safeguards presented its final draft staff technical position (STP) on "The Identification of Fault Displacement and Seismic Hazards at a Geologic Repository." The ACNW completed its deliberations regarding this matter during its 39th meeting, January 15-17, 1992. At the working group meeting, the Committee also held discussions on the draft STP with representatives of the U.S. Department of Energy (DOE), the State of Nevada, and the Edison Electric Institute. In addition, the Committee benefited from a presentation by representatives of the American Society of Civil Engineers, an organization that is completing a draft of a report on faulting and seismic design considerations for a high-level waste repository. We believe this report, when complete, will also provide a useful and important viewpoint on the analysis of fault and seismic data.

On the basis of these discussions, the ACNW has the following recommendations and comments.

Recommendations

1. We believe that the STP should be completed and issued in a timely manner. There is a need for the guidance provided by the STP since DOE has already begun site characterization and investigations for faulting and seismic hazards. In addition, the staff has previously identified concerns related to the DOE site characterization program of investigations for hazards of fault displacement and seismicity (NUREG-1347, "NRC Staff Site Characterization Analysis of the Department of Energy's Site Characterization Plan, Yucca Mountain, Nevada," August 1989). The number and importance of these concerns also demonstrate the need for the STP. The same concerns continue to be relevant to DOE study plans that relate to site investigations for seismic and faulting hazards.

2. The STP provides guidance on investigations for seismic and fault displacement hazards. A companion STP on the analyses of such hazards, currently being prepared by the NRC staff, will provide information critical to the analysis of data collected for the evaluation of these hazards. Because of the strong linkage between these two STPs, we urge the staff to expedite the completion of the companion STP. We further urge that the staff integrate its efforts on guidance related to tectonic investigations and analyses.
3. In addition to the subject STP, there is a need for a statement, in the form of an STP followed by rulemaking, on the acceptability of geologic repository sites with "susceptible" faults present within the controlled area. We believe that the staff should initiate this action as soon as possible.
4. The staff has also proposed a third STP in its hierarchy of documents related to its strategy for guidance on tectonics. This third STP, previously issued as a draft for public comment in 1989, provides guidance on the use of tectonic models that apply to site investigations and iterative performance assessments. The staff has held work on this STP in abeyance until the revised U.S. Environmental Protection Agency (EPA) high-level waste standards (40 CFR Part 191) are issued. Because of the need for this guidance during early site characterization, the staff should move forward regardless of progress in development of the revised EPA standards.

Specific Comments

Several other concerns were expressed during the working group and full Committee meetings. On the basis of the related discussions, we recommend that the STP be modified to incorporate the following suggested changes.

1. The term "susceptible faults" should be abandoned. We suggest that the staff use a categorization scheme for faults or substitute some other nonprejudicial term.
2. The definition and use of the term "geologic setting" are confusing. The staff should clarify the meaning of this term. For guidance on this matter, we suggest that the staff refer to the definition in 10 CFR 60.2.
3. The staff should consider clarifying the use of the term "relevant and material" in the STP, and substitute, where possible, the technical equivalent.
4. The staff should further emphasize that Appendix A of 10 CFR Part 100 does not apply to a high-level waste repository. Such a statement should be included in the introduction of the

subject STP. There still appears to be some confusion among certain reviewers of the STP as to the staff's intent in this regard.

5. The STP should not preclude the use of probabilistic assessments of candidate faults lying outside the controlled area. A clarifying statement that a qualitative probabilistic performance assessment is acceptable should be added to the text accompanying Figure 1.
6. The staff should revise Figure 3 of the STP to indicate that only if Quaternary evidence is incomplete or unclear, should secondary criteria be evoked.
7. With respect to the use of fault length as a criterion (page 12 of the STP), it is important to consider the length of both discrete faults and fault zones, portions of which may rupture during an earthquake (e.g., Cedar Mountain earthquake of 1932). A statement to that effect should be added to the STP.
8. The staff should revise the STP to reflect more specifically the three-dimensional aspects of fault structures.
9. The title of the STP should be changed to "seismic and fault displacement hazards" to clarify that hazards refers to both areas of concern.

It is our conclusion that the subject STP will provide important and necessary guidance to the site characterization program and should be issued as soon as possible. We urge that the staff expedite the completion of companion documents to this STP and issue those documents in a timely manner. The Committee has also provided the staff with a list of editorial comments regarding the subject STP.

Sincerely,



Dade W. Moeller
Chairman

Reference:

Staff Technical Position on Investigations to Identify Fault Displacement and Seismic Hazards at a Geologic Repository, Revised Public Comment Draft, November 1991