Department of Energy
Washington, DC 20585

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Mr. David L. Meyer, Chief
Regulatory Publications Branch
Division of Freedom of Information
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U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Meyer:

The Department of Energy (DOE) welcomes the continuing opportunities for interaction with the Nuclear Regulatory Commission (NRC) staff in the review of the draft Staff Technical Position (STP) on "Investigations to Identify Fault Displacement and Seismic Hazards at a Geologic Repository", published for public comment on May 13, 1991, (56 FR 22020). This letter provides a summary of DOE's position regarding this STP. DOE proposes that the staff hold in abeyance this STP and other planned STP's on tectonic and seismic issues for the reasons discussed below.

Although the draft STP has been considerably enhanced with respect to earlier versions, DOE believes that a demonstrated technical basis for the STP is lacking, and that the STP is not needed for regulatory purposes. In addition, the STP could limit DOE's ability to optimize the allocation of resources among site characterization and design efforts with respect to reducing total uncertainty in assessing repository systems performance. DOE appreciates the NRC staff's legitimate concern that the site characterization program provide data that are sufficient to validate models used to predict the performance of potential repository systems, and we are preparing a position paper on earthquake-hazard investigations that will address this issue. In addition, the American Society of Civil Engineers (ASCE) is preparing a Guideline for High-Level Waste Repository Seismic Design, and the U.S. Nuclear Regulatory Commission's Office of Research is revising the seismic and geological siting criteria for nuclear power plants. We hereby propose that the NRC staff hold in abeyance the subject STP and planned STP's on tectonic and seismic issues until these documents have been issued and then re-evaluate the need for the STP.

DOE believes that the technical basis for the STP has not yet been demonstrated. The methodology proposed in the STP appears to be based, in part, on a judgment by the NRC staff that the risk to public radiological health and safety would be unacceptable if a fault with certain characteristics was not investigated in detail. Such a fault would be one that, 1) is

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oriented so that it could theoretically move in the existing stress field and might impact repository performance, even if that fault does not displace Quaternary materials, 2) has no apparent correlation with historical seismicity, and 3) has no structural relationship to another fault thought to be subject to displacement. The DOE believes that this apparent a priori judgment is highly debatable and that no technical basis for the approach has been provided.

Another concern of DOE is the explicit rejection by the STP, again without any technical basis, of the use of probabilistic techniques in determining which faults require detailed investigation. DOE has proposed and continues to believe that a combined probabilistic-deterministic approach to earthquake hazard investigations and design-basis development is the most appropriate and is representative of the current state of the art. We note that the revised version of 10 CFR 100, Appendix A is likely to endorse a combination of probabilistic and deterministic approaches, as is the ASCE guideline noted above. Therefore, for consistency, publication by NRC of a documented technical basis for rejecting the probabilistic approach should be provided before issuing the STP.

A key component of DOE's strategy for investigating seismic and other hazards is an iterative approach to site characterization and performance assessment, in which the performance of a potential repository system is analyzed in light of available site information, and the need for more information is assessed in light of remaining uncertainties. This strategy demands a flexible approach to the investigation of earthquake hazards. The deterministic, "susceptible fault" methodology that is proposed in the STP is too prescriptive and would, if implemented, unnecessarily limit DOE's ability to focus its resources on that set of site characterization, performance assessment, and design activities that will most effectively and efficiently reduce uncertainties in the performance of potential repository systems.

As stated in our letter to you of February 27, 1990, we believe that additional regulatory guidance on investigations of fault displacement and seismic hazards is unnecessary because DOE's published plans for acquiring and analyzing fault and earthquake-related data and for demonstrating compliance with the performance criteria of Part 60 are adequate and will ensure a safe seismic design. DOE's position paper referred to earlier will address the concerns expressed by the NRC staff in its comments on the Site Characterization Plan (SCP) and in discussions at the various technical exchanges on tectonics. Previously, the NRC staff has informally expressed the opinion that additional clarification of DOE's program, beyond the descriptions in the SCP and responses to NRC comments on the SCP/Consultation Draft and Site Characterization Analysis, might lead to the resolution of several comments and obviate the need

to complete several draft STP's on tectonics and seismicity. We would be pleased to discuss with you the focus for the proposed position paper. We would then provide a draft of the position paper to the NRC staff for its consideration and formal comment. DOE agrees with several aspects of the STP, most notably that it does not defer to Appendix A of 10 CFR Part 100 for guidance in addressing fault displacement and seismic hazards at a geologic repository. The proposed guidance on correlating historical earthquakes with geologic structures or seismic source zones now includes a reasonable test for potential significance, the previous 200-mile radius test having been dropped. Review of the current draft of the STP shows that the NRC staff considered and incorporated many of the comments provided by DOE and other parties in previous reviews, including the technical exchange held on February 20, 1991.

DOE's primary concern remains the potential significance to siting and design of the proposed concept of "susceptible" faults. As indicated by DOE as well as representatives of the State of Nevada and the Edison Electric Institute at the February 20, 1991, technical exchange, it is imperative that the role of "susceptible" faults in any future guidance on tectonic models and design be specified before the concept is finalized. One indication of the need to review this related guidance is the statement on page 69 of Appendix C: "The staff is currently considering additional guidance on an acceptable approach to setback of facilities . . . from 'susceptible' faults . . ." Such potential impacts on design and performance assessments must be considered in determining the appropriateness of the "susceptible" fault concept.

The concept of "susceptible" faults has not been reviewed by, and is not recognized by, the geologic community. It is a unique NRC concept. As noted by the State of Nevada representative at the February 20, 1991, technical exchange, this concept should be submitted for review by a broad range of earth science professionals. This review is essential to legitimize a concept with such potentially significant impacts. Further, the term "susceptible" faults has no regulatory basis or precedent. It would be inappropriate to introduce to the repository program a concept that would undoubtedly be the subject of protracted controversy during licensing proceedings, due largely to its uniqueness.

Also, the term "susceptible" connotes a high probability for future displacement. In actuality, a fault could meet the criteria for being "susceptible" and have a very low probability of displacement, or even of being active. Additionally, the term "susceptible" faults could be incorrectly perceived by both the scientific community and the public to be equivalent to "capable faults," as defined in the reactor siting criteria of Appendix A to 10 CFR Part 100, in essence, a capable fault by another name. Although the STP specifically addresses the

differences between these concepts, comparisons are probably unavoidable. DOE recommends that the NRC staff simply refer to "faults that require detailed investigation"; a new nomenclature is not needed.

In conclusion, it is our position that the subject STP is unnecessary given the scope of planned investigations presented in the SCP, a document accepted by the NRC. For this reason, comments beyond those in this letter should not be anticipated. However, if the NRC staff is going to revise and finalize the STP, there are several major concerns that must be addressed. Most notably, a "susceptible" fault, both the term and the concept, is unscientific and has no technical basis as currently drafted.

If you have any questions, please contact Priscilla Bunton at 202-586-8365.

Sincerely,

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