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

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April 8, 1994

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

Dear Chairman Selin:

SUBJECT: RECENTLY DISCOVERED FAULTING AT YUCCA MOUNTAIN AND ITS IMPLICATION FOR NRC ON-SITE GEOLOGIC REPRESENTATION

The purpose of this letter is twofold: (1) to advise the Commission on new findings of faulting in the repository block, and (2) to recommend that the Commission expand the capability in pertinent geologic sciences at the office of the NRC On-site Representative in Las Vegas to ensure that the NRC staff is fully knowledgeable about recent geologic findings that could have a major impact on the NRC staff activities in the repository program.

SPECIFIC COMMENTS

1. In conjunction with the 59th ACNW meeting, held in Las Vegas, Nevada, a field trip was scheduled on December 15, 1993, to the Yucca Mountain site so that members of the Committee could be briefed by the Department of Energy (DOE) principal investigators (PIs) on recent studies at the Ghost Dance and Solitario Canyon Faults. In response to questions by Committee members during the briefing on the Ghost Dance Fault, the PI indicated that a new fault, called the Sundance Fault, had been identified by detailed mapping. Although the full extent of the fault had not been mapped, it was determined that the fault intersects and offsets the Ghost Dance Fault, indicating a younger age for the former. The age of the fault may have regulatory significance if movement occurred in the past two million years.

   Members of the Committee returned to the site on January 31, 1994, to inspect the fault zone and examine the field evidence for this new fault. They were informed by the PI that field studies led investigators to believe that the Sundance Fault is a zone of faulting at least 245 meters wide, consisting of at least six faults. The Sundance Fault is of potential significance for several reasons.

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The presence of the Sundance Fault could adversely impact the areal extent of the repository if the fault zone extends to the depth of the planned repository and if the DOE intends to set back the repository from Quaternary age faults as it has for the Ghost Dance. This matter is supplemented by recent surface geological mapping, which clearly shows that the Ghost Dance Fault, instead of being a single fault, is actually a zone of faults 215 meters wide. Also, indications from the available geologic maps suggest that the Sundance Fault zone may be only one of a family of zones which have not yet been fully identified because of insufficient detail on existing maps of the proposed repository site. These factors indicate that extra site characterization effort will likely be needed to determine the age of the last movement on these faults and to specify the extent of faulting of the proposed repository formation.

The Committee concludes that the Yucca Mountain site may be more disrupted than anticipated. These results strongly point to a need for an increased commitment of staff resources to ensure that the NRC has a timely and comprehensive picture of the configuration of the proposed repository site.

2. The Committee anticipates that near-term activities at Yucca Mountain, including maintenance of the present DOE tunnel boring schedule, may overtax the NRC on-site geologist and the NMSS geology staff. The Committee strongly recommends that more geologists trained in structural geology be part of the staff at the NRC Office of the On-site Representative to monitor and report, in a timely manner, on significant geologic findings. We recommend that the on-site geologic staff have adequate expertise to recognize the potential significance of features uncovered in exploratory studies facility construction and site characterization studies.

3. The work leading to the recognition of the Sundance Fault also brought into focus a problem relating to the interaction between the NRC staff and the DOE. During the January briefing, the Committee was joined by two NMSS geologists. It is our understanding that the NRC staff, without participation in our field trip, would not have received a formal briefing on this feature until May. This delay in obtaining information on newly recognized geologic conditions of such potential importance should not be considered acceptable in view of the need by the NRC staff to respond to activities and findings at Yucca Mountain. The Committee strongly recommends that the Commission urge the NRC staff to study and propose for further discussion with DOE means to expedite interactions between NRC and DOE staffs and to enhance the flexibility available to the NRC staff to effect such interactions.

We trust this information will be useful.

Sincerely,

Martin J. Steindler
Chairman