UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 12, 1997

Dr. Stephan Brocoum
Assistant Manager for Licensing
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P. O. Box 30307
North Las Vegas, Nevada 89036-0307

SUBJECT: ISSUE RESOLUTION STATUS REPORT (KEY TECHNICAL ISSUE: STRUCTURAL DEFORMATION AND SEISMICITY)

Dear Dr. Brocoum:

As you know, the staff of the U.S. Nuclear Regulatory Commission has developed a program for early resolution of technical issues at the staff level. In the past, staff-level issue resolution has been achieved by responding to the U.S. Department of Energy's (DOE's) proposed closure of NRC open items, or through response to topical reports. The new process for early resolution has been demonstrated through our release, on June 30, 1997, of a pilot issue resolution status report (IRSR) on climate change and associated effects.

The enclosed IRSR focuses on the seismotectonic features, events and processes that may significantly affect the performance of a repository. There are four subissues that must be addressed to estimate the performance of a proposed repository at Yucca Mountain (YM), including their adequate characterization, sufficient understanding and consideration of their significance, and the appropriate use of abstractions for evaluations of long-term performance. The four subissues include: fault slip, seismic motion, fractures and site discontinuities, and tectonics and crustal conditions. DOE's Waste Containment and Isolation Strategy recognizes the importance of consideration of faulting and seismic disruptive events, and of consideration of rock-penetrating fracture and fault systems on seepage.

Consistent with 10 CFR Part 60 requirements and a 1992 agreement with DOE, staff-level issue resolution can be achieved during the prelicensing consultation period. However, such resolution at the staff level would not preclude the issue being raised and considered during the licensing proceedings. Issue resolution at the staff level during prelicensing is achieved when the staff has no further questions or comments (i.e., open items) at a point in time, regarding how the DOE program is addressing an issue. There may be some cases where resolution at the staff level may be limited to documenting a common understanding regarding differences in NRC and DOE points of view.

Pertinent additional information could raise new questions or comments regarding a previously resolved issue. The enclosed IRSR summarizes an independent, prelicensing review of a part of each of the fault slip and tectonic models subissues, specifically, Type I faults and tectonic models, respectively. The staff concludes that resolution has been achieved on the identification of faults that may significantly affect repository design or performance (Enclosure, Appendices B-1, B-2, and B-4; there are about 84 Type I faults).

1/1
WM-11
NH16
102

98-106

Also, the staff concludes that resolution has been achieved on what are the viable tectonic models of YM (Enclosure, Appendix C-1). Further, the staff concludes that resolution has been achieved on one comment concerning seismic motion in the Site Characterization Analysis (SCA; NUREG-1347; Enclosure, Appendix D, Comment 66). Moreover, based on the scientific literature, NRC staff concludes that methods exist to bound the range of future changes to the seismotectonic component of the geologic setting and the resulting consequences. Adequate methods are currently available to reasonably estimate future site behavior with regard to: faulting; seismicity; fracturing; geomechanical disruption of waste packages; structural controls of flow of water, moisture, heat, magma; and stability of the Geologic Repository Operations Area, and the engineered and natural barrier systems.

As discussed in the IRSR, the key technical issue will continue to be an open item until the four subissues are resolved. The substance of many open items encompassed by the subissues is expected to be addressed by DOE in documents scheduled for release in fiscal year 1998, such as "Probabilistic Seismic Hazard Analysis Report" and "Topical Report #3." Staff will review those and other documents in preparation for Revision 1 of this IRSR. The subject of Revision 1 will include review of the status of these open items discussed in the Enclosure: (a) probabilistic fault displacement hazard; (b) probabilistic seismic hazard; (c) fracture discontinuity models; and (d) SCA and other outstanding open items.

Finally, the Enclosure should be viewed as a status report that provides the staff's most current views on faults and tectonic models of significance to repository design and performance of the proposed repository at YM.

The report will be updated or revised in the future, as additional information becomes available. We welcome a dialogue on this subject with DOE, the U.S. Nuclear Waste Technical Review Board, State of Nevada, and other interested parties. If you have any questions about this letter, please contact Philip Justus of my staff at (301) 415-6745, or via internet mail service (psj@nrc.gov).

Sincerely,

N. King Stablein, Acting Chief
Engineering and Geosciences Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

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Newton K. Stablein, Acting Chief
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