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Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

(2)
54FR25762
6/19/89

Re: Draft Technical Position on
Tectonic Models in the
Assessment of Performance of
High-Level Radioactive Waste
Repositories (54 Fed. Reg. 25762)

Dear Sir:

These comments are submitted on behalf of the High-Level Waste Working Group of the U.S. Council for Energy Awareness (USCEA) in response to the above reference notice. USCEA provides information on energy issues, with emphasis on the importance of electricity and the roles of nuclear energy and coal in providing it, and examines technical issues related to the peaceful uses of nuclear technology.

We commend the NRC for the development of Draft Technical Positions in the various areas which must be considered in the licensing of a high-level radioactive waste repository. We encourage you to continue to generate these draft positions and subject them to public review well in advance of the submittal of a license application.

Our specific comments on the referenced draft technical position are enclosed. Generally, we found the technical position well thought out and competently written, however, we are concerned that the NRC limits models to deterministic. The NRC has been encouraging alternative models in a number of areas. It would, therefore, be appropriate to consider probabilistic models as well as deterministic models in tectonic modeling.

Enclosed are our specific comments which address our technical concerns. If you have any questions or desire additional information, please let us know.

Sincerely,

John R. Siegel
Vice President

Enclosure

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SPECIFIC COMMENTS

Section 1.4, line 5

The word "them" should be replaced with "Technical Positions". The sentence could be read to imply that compliance with regulations is not required.

Section 2.2, line 1

This line needs to be rewritten. The Technical Position (TP) defines "predictive models". Part 60.21 (c) (1) (ii) (f) does not.

Section 2.2, Paragraph 2, line 5

The phrase "the area of the site" should be revised to "the area of any site".

Section 2.2.1

This section needs to be reconsidered. Part 60.111(a) is concerned with normal operating conditions. Tectonic events are regarded as off-normal or accident conditions. This approach mixes accidents and accident dose guidelines for facility design with what is used for routine normal operating conditions. The rewriting of this section should reflect past and current NRC licensing practices. The last sentence of the section is appropriate for the preclosure period.

Section 2.2.2, paragraph 2

The word "key" should be deleted from the first line. The TP should be generic and not written specifically to address Yucca Mountain.

Section 2.2.3, last sentence

This sentence should be deleted. Incomplete records don't necessarily indicate alternative conceptual models could be employed to identified processes not evidenced. More logic as to why this would be acceptable needs to be supplied. This has no precedence in the licensing of nuclear facilities and appears to be a new interpretation by the NRC.

Section 3.C.2

10 CRF Part 60 defines anticipated processes and events as those reasonably likely to occur during the period to which the regulations apply. Tectonic models certainly have a place in the activity of determining anticipated processes and events. But the prescriptions and examples given in the draft TP seem to take the set of processes and events beyond the "reasonably likely". For instance, Sec. 4.1, 2nd paragraph end, gives an example of faults which are "favorably oriented for failure" in the present stress regime. Even if these faults have demonstrably not moved during the whole quaternary period, the draft TP would consider these faults as capable and as part of the design basis. Although the alternative conceptual models would be of legitimate use in identifying a potential phenomenon for further study, the drawing of an affirmative conclusion on "reasonably likely" without such further study is unwarranted.

Section 3.D

This section needs to be revised to allow probabilistic arguments and models as well as deterministic models. In support of this is the referenced paper, "Probabilistic Seismic Hazard Analysis - Lessons Learned, A Regulator's Perspective" by NRC staff member Leon Reiter. The last two paragraphs of L. Reiter's paper follow:

"Thus the paradox for the decision maker is that while it is seemingly advantageous to take uncertainty into account in probabilistic seismic hazard analysis doing so also can make his or her job considerably more difficult. This is one reason why many are ill at ease with this approach. There is a tendency to either envelope the results (if one can live with the conclusions) or dismiss probabilistic calculations altogether (if one can find some "deterministic" rationale which does not explicitly consider uncertainty). This is a fertile area for decision analysis which may be able to provide an explicit framework for decision making in the face of such uncertainty."

CONCLUSIONS

"Probabilistic seismic hazard analysis is a powerful, rational and attractive tool for decision making. It is capable of absorbing and integrating a wide range of information and judgement and their associated uncertainties into a flexible framework that permits the application of societal goals and priorities. Unfortunately, its highly integrative nature can obscure those elements which drive the results, its highly quantitative nature can lead to false impressions of accuracy and its open embrace of uncertainty can make decision making difficult. Addressing these problems can only help to increase its use and make it more palatable to those who need to assess seismic hazard and utilize its results."

Additionally, the last sentence should be deleted. The concept -- that if volcanism has occurred in a geologic setting during a quaternary it should be used as a basis in deterministic assessment -- is not a viable approach. It should also be pointed out that EPA requires probabilistic methods to demonstrate regulatory compliances.

Section 4.1, paragraph 2

Delete the last line. There is no rationale for the statement that repository barriers should consider all favorably oriented faults as faults that are subject to failure. Additionally, the EPA requirements would require a probabilistic approach rather than the deterministic approach used in the TP.

Section 4.3, last line

The last sentence needs to be rewritten or deleted altogether. It suggests that anticipated and unanticipated events used with tectonic models rely only on deterministic criteria. However, EPA requires probabilistic criteria to demonstrate regulatory compliance which is more relevant in the postclosure period. Therefore, the TP should be revised for consistency.