

DS09. /  
J. Linnahan

# 750

LORING E. MILLS, Vice President

# EDISON ELECTRIC INSTITUTE

The association of electric companies

1111 19th Street, N.W.  
Washington, D.C. 20036-3691  
Tel. (202) 778-6400

August 18, 1989

①

54FR25762

6/19/89

Chief  
Regulatory Publications Branch  
Division of Freedom of Information  
and Publications Services  
Office of Administration  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Re: Draft Technical Position on Tectonic Models in the Assessment of Performance of High-Level Radioactive Waste Repositories (54 Fed. Reg. 25,762)

Dear Sir:


The attached comments on the above-reference document are submitted by the Edison Electric Institute/Utility Nuclear Waste and Transportation Program (EEI/UWASTE). The Electric Power Research Institute (EPRI) contributed to this review. EEI is the association of the nation's investor-owned electric utilities. UWASTE is a group of electric utilities providing active oversight of the implementation of federal statutes and regulations related to radioactive waste management and nuclear transportation. EPRI is the organization founded by the nation's electric utilities to manage a research and development program for improving electric power production, distribution, and utilization.

Our comments deal with three areas of concern. In particular, we believe that it would be more appropriate if the Technical Position was more generic in nature. In addition, EEI/UWASTE feel that the document should clearly specify the importance of the Quaternary Period. Finally, we believe that the document could be improved in terms of its consideration of anticipated processes from both (a) mechanistic, and (b) probalistic, perspectives.

8908250013 890818  
PDR PR  
MISC 54FR25762 PDR

We appreciate the opportunity to comment on the subject Draft Technical Position. Please do not hesitate to call if you have questions, or desire further information with regard to our comments.

Sincerely,

  
Loring E. Mills

LEM/ipm

**EEI/UWASTE Comments on the  
Nuclear Regulatory Commission's Draft**

**TECHNICAL POSITION ON TECTONIC MODELS  
IN THE ASSESSMENT OF PERFORMANCE OF HIGH-LEVEL  
RADIOACTIVE WASTE REPOSITORIES  
(54 Fed. Reg. 25,762)**

**August 18, 1989**

The following comments on the above-referenced document are submitted by the Edison Electric Institute/Utility Nuclear Waste and Transportation Program (EEI/UWASTE). The Electric Power Research Institute (EPRI) also contributed to this review. As a result of reviewing the Draft Technical Position, EEI/UWASTE have particular concerns in three areas.

**Generic Applications**

EEI/UWASTE do not take issue with the definitions provided in the Technical Position. However, the Technical Position, as drafted, was clearly prompted by the Yucca Mountain site. (See, e.g., Technical Position Section 1.1 (referring to the Site Characterization Plan for Yucca Mountain)). Accordingly, we believe that it would be more appropriate if the Technical Position was more generic in nature and did not contain any site specific applications.

## Quaternary Period

A majority of geologists would probably agree that the most reasonable bases for projecting events and processes into the relatively near future are to be found in that part of geologic history that has occurred recently and is still active today. In geologic parlance, that operational epoch is the Quaternary Period -- approximately the last two million years -- a time during which crustal-plate motion, climate changes, erosion and deposition, and biological evolution took place in particular ways and differently from those of preceding periods. The last two million years is 200 times longer than the 10,000-year life of the planned repository and, even from a statistical point of view, should provide a reasonably valid sampling for projections into the future.

The Draft Technical position offers no support or explanation for attaching special significance to the Quaternary Period. It should, however, be specific in this regard. Further, it should state more clearly that processes and events that have not occurred in the Quaternary Period need not be considered in assessing a site.

## Probability Assessments

The Draft Technical Position indicates that, in general, deterministic rather than probabilistic methods should be the primary means of distinguishing anticipated from unanticipated processes and events. The Draft Technical Position takes the view that probabilities of anticipated and unanticipated processes and events cannot be accurately quantified.

A different position that should be considered by the NRC is that probabilities of basic tectonic characteristics and models can provide a rational way to distinguish among models, and can lead to a rational way to derive probabilities of the effects of alternative models on the repository. This approach has been accepted by the NRC in the past<sup>1/</sup> in conjunction with earthquake issues in the eastern US, and has been sponsored by the NRC in developing its own assessment of nuclear plant safety<sup>2/</sup>. The distinction is that one must make probability assessments of the underlying tectonic models, using all available evidence and data and incorporating uncertainties in models and data where appropriate. One should not make probability judgments directly on the effects of alternative models; these must be derived from the underlying assessments. Using probabilities in this mode allows those closest to the scientific issues (i.e. the earth

---

<sup>1/</sup> J. Richardson, "Safety Evaluation Review of the SOB/EPRI Topical Report Titled Seismic Hazard Methodology for the Central and Eastern United States," US Nuclear Regulatory Commission, 1988.

<sup>2/</sup> D.L. Bernreuter, J.B. Savy, R.W. Mensing, J.C. Chen, and B.C. Davis, "Seismic Hazard Characterization of the Eastern United States," Technical Report LLNL UCID-20421, Vols 1 and 2, Lawrence Livermore National Laboratory, Livermore, CA, 1985.

scientists) to propose and refine the probabilities. The probabilities of models and their effects on the geologic structure and repository can then be assembled in a logical framework that is transparent and available for review<sup>3/</sup>.

Developing procedures to incorporate probabilities will allow direct assessment of tectonic events that are "reasonably likely to occur," (Draft Position, Section 2.2.1), and to distinguish between anticipated and unanticipated processes and events (the former are those that are "sufficiently likely to occur" - Draft Position, Section 2.2.2). In fact, the explicit use of probabilities is a logical and convenient way in which scientific judgments about the alternative models are "reasonably likely" can be developed and justified using a quantitative expression of scientific judgment and understanding. Moreover, a consistent approach to this representation will divulge whether a high likelihood for a future adverse condition results from a high probability of occurrence, or from large uncertainties in current knowledge (which the site investigation would reduce). Knowledge of this type can help shape the program for site specific investigations.

---

<sup>3/</sup> See also the Letter from John J. Kearney to Ronald L. Ballard, dated April 28, 1988, forwarding EEI and Utility Nuclear Waste Management Group (a predecessor of EEI/UWASTE) comments on the draft NRC technical position on "Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events".