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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE NUCLEAR REGULATORY COMMISSIONERS

In the Matter of	)	
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al.	)	Docket Nos. 50-442 50-443
(Seabrook Station, Units 1 and 2)	)	

NECNP RESPONSE TO STAFF OPPOSITION TO PETITION FOR REVIEW

On December 11, 1979, the NRC Staff filed its opposition to the petition for review of the seismic design decisions for the Seabrook nuclear plant filed on September 26, 1979, by the New England Coalition on Nuclear Pollution (NECNP or the Coalition). The Staff argues that review of the issue by the Commission is not permitted under the Commission's regulations because there is no disagreement between the Licensing Board and the Appeal Board on what the Staff terms the purely factual question of the choice of the proper Safe Shutdown Earthquake and maximum vibratory acceleration for the Seabrook plant.

The discussion provided in NECNP's Supplemental Memorandum, which will not be repeated here, amply demonstrates that the seismic issue is one of both fact and law. It raises significant safety and environmental questions and involves interpretation of the Commission's seismic regulations. Thus

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Commission review under 10 CFR 2.786 is appropriate. This brief response will focus on the impact of the Staff's failure to provide the two new Chinnery reports to the Appeal Board prior to the issuance of Board Member Farrar's dissent and the majority's supplemental opinion. As the Staff response reflects, the Appeal Board reached its conclusions about Dr. Chinnery's testimony without an opportunity to review Dr. Chinnery's more recent work. In ALAB 422,[1] the Appeal Board rejected Dr. Chinnery's testimony as lacking sufficient foundation. The Board criticized his failure to provide the basis for his assumptions and generally disparaged his qualifications to testify. (See, for example, the quotation used by the Staff at page 4 of its response.)

The recent studies carried out by Dr. Chinnery under contract to the NRC support the testimony given in the Seabrook proceedings and offer a more complete explanation of Dr. Chinnery's assumptions. As a consequence, the studies are responsive to much of the Appeal Board's criticism. For example, in ALAB 422, supra, the Appeal Board held that there was no basis for the assumption that there is no limit to the maximum intensity earthquake in any given area. In his review of the seismological input to the safety of nuclear plants in New England, Dr. Chinnery studied the possibility of

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[1] In the Matter of Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2) 6 NRC 33.

estimating the maximum intensity earthquake that might be expected within a given region. Dr. Chinnery once again concluded that there is no empirical or physical basis for assigning an upper limit to the maximum possible earthquake in New England. The report supports the straightline extrapolation which Dr. Chinnery used in his testimony for NECNP to estimate a return time for a MMI IX earthquake at the Seabrook site, and gives additional basis for it.

The affidavit of McMullen and Reiter attached to the Staff response acknowledges that Dr. Chinnery's theories may not simply be dismissed as lacking validity. The problem of estimating the maximum possible earthquakes for different regions is termed "very difficult," particularly in the eastern United States. In fact, the affiants state, "there really is no way seismologists can absolutely rule out the occurrence of earthquakes larger than the historical maximum anywhere in the east" because of the lack of understanding of the causative mechanisms of earthquakes. (Affidavit, p. 5). The affiants also state that "a recent clarification of [10 CFR Appendix A] has indicated that geological and seismological data could result in the use of a larger earthquake to determine the SSE." (Id)

In "A Comparison of the Seismicity of Three Regions of the Eastern U.S.," Dr. Chinnery also answers the Appeal Board's criticism. This study demonstrates that a comparison of earthquake data from three different regions of the

country shows a constant relationship between frequency and intensity of earthquakes. This relationship allows Dr. Chinnery to estimate the probability of large earthquakes in southern New England, as he did in his testimony in the Seabrook proceedings.

Although McMullen and Reiter do not agree with Dr. Chinnery's conclusions, they do acknowledge that the probabilistic approach which he used has been under discussion for many years, and that there is no consensus "within the seismological community as to the constancy of values and the linear extrapolation of return periods." The affiants indicate that the Staff is currently studying the potential for a systematic incorporation of probabilistic estimates into the establishment of earthquake design parameters for nuclear plants.

NECNP does not assert that the Appeal Board would have changed its mind about Dr. Chinnery's conclusions had it been provided with his new studies prior to the preparation of the dissent and supplemental opinions. However, the new studies may well have helped resolve the Board's concerns about the credibility of Dr. Chinnery's testimony. These concerns aside, the Board could then have focused on the substantive issues addressed in the testimony, and the differences of opinion among the Staff, Applicant and Coalition. As a result, the Board's rulings could well have agreed with NECNP.

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The Staff dismisses the substantive differences on the seismic issue with the sentence "The dissent credited Dr. Chinnery's testimony, while the majority did not," (Page 8). Why the Staff disparages work done by an expert with whom the agency has contracted and using an approach which it is examining for incorporation into its own methodology is a question not answered in the Staff response. It is indicative, however, of the way the Staff has dealt with the seismic issue throughout the appeal process.

The Staff appears to regard the choice of the appropriate Safe Shutdown Earthquake and maximum vibratory ground motion for Seabrook as an abstract mathematical exercise with no relation to the design and construction of the plant. It has not addressed the significant consequences of error in the choice of the Safe Shutdown Earthquake in terms of delay and cost, as well as increased risk to the public safety. Rather, the Staff has expressed the opinion that "safety margins inherent in nuclear plant design are adequate to compensate for very significant changes in seismic input requirements." (Affidavit of James P. Knight, Assistant Director for Engineering, attached to Staff request for extension of time to file response to NECNP supplemental petition for review.)

Experience with the results of changes in seismic input requirements is, of course, to the contrary. At the Diablo Company facility, for example, an increase of the input motion from .40 to .75 forced the Applicant Pacific Gas and

Electric Company to significantly modify the plant, and debate continues as to whether the modifications are adequate.

Significant changes in the seismic design of the Seabrook plant could alter both the structure and the components of the facility, causing further delays in construction and additional expense.

The structures of the Seabrook plant have been designed to withstand the stress associated with a response spectra anchored to .25 g. The foundation specifications for these structures are determined by the characteristics which it must support. No calculation has been made to assess whether the Seabrook foundation has a sufficient design margin to withstand stresses characterized by a response spectrum anchored at .40 g. If the seismic design of the plant is changed as a result of Commission review, the very foundation of the plant may need to be altered in a signficant way.

In addition, Public Service Company of New Hampshire has ordered components and equipment which have been tested to withstand the stresses derived from a response spectra anchored to .25 g.[/] This equipment may have to be replaced, in large part, if the Commission determines that .40 g is the appropriate maximum vibratory ground motion for the Seabrook site.

[/] The input motion for testing plant equipment and components is derived from the structural response characteristics calculated for the plant.

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CONCLUSION

The foregoing discussion illustrates that, despite the passage of 3 1/2 years since the Licensing Board issued its decision on Seabrook, the seismic design question is not a paper issue. It involves fundamental questions about plant design and interpretation of the Commission's regulations. NECNP urges the Commission to review the matter.

Respectfully submitted,

Karin P. Sheldon

Karin P. Sheldon

SHELDON, HARMON & WEISS
1725 "I" Street, N.W., Suite 506
Washington, D.C. 20006
(202) 833-9070

Counsel for NECNP

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(Seabrook Station, Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that the foregoing "NECNP Response to Staff Opposition to Petition for Review," was mailed, postage prepaid, this 28th day of December 1979, to the following:

Victor Gilinsky, Commissioner
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Richard T. Kennedy, Commissioner
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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Peter Bradford, Commissioner
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Stephen F. Eilperin, Esq.
Stephen S. Ostrach, Esq.
Office of the General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

POOR ORIGINAL

Alan S. Rosenthal, Chairman
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. John H. Buck
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Michael C. Farrar, Esq.
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ivan Smith
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Ernest O. Salo
Professor of Fisheries Research Institute
College of Fisheries
University of Washington
Seattle, Washington 98195

Dr. Marvin M. Mann
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Larry Brenner, Esquire
Marcia Mulkey, Esq.
Office of the General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Laurie Burt, Esq.
Assistant Attorney General
One Ashburton Place
Boston, Massachusetts 02108

Assistant Attorney General
Environmental Protection Division
Office of the Attorney General
State House Annex, Room 208
Concord, New Hampshire 03301

Docketing and Service Section
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Joseph Hendrie,
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

John Ahearne
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Robert A. Backus, Esq.
O'Neill Backus Spielman Little
116 Lowell Street
Manchester, New Hampshire 03101

Thomas G. Dignan, Jr., Esq.
Ropes & Gray
225 Franklin Street
Boston, Massachusetts 02110

POOR ORIGINAL

Karin P. Sheldon