



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

ACRS R-1054
PDR

October 17, 1983

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

Dear Dr. Gilinsky:

SUBJECT: ACRS COMMENTS ON USE OF THE "TAU EFFECT" AT THE DIABLO CANYON
NUCLEAR POWER PLANT

During its 282nd meeting, October 13-15, 1983, the Advisory Committee on Reactor Safeguards (ACRS) considered the questions you raised in your letters of September 8 and 28, 1983. A meeting of the ACRS Subcommittee on Extreme External Phenomena was held on October 12, 1983 to consider these questions. During its review, the Committee had the benefit of discussions with representatives of the Pacific Gas and Electric Company and the Joint Intervenors as well as with its own consultants and the NRC Staff.

In your letter of September 8, 1983 you asked for our opinion on, "whether it was appropriate to use the 'tau effect' at Diablo Canyon." In your letter of September 28, 1983, you asked, in particular, "whether the Committee believes the specific quantitative reductions applied to the Diablo Canyon spectrum are justified on the basis of scientific or engineering analysis."

The "specific quantitative reductions applied to the Diablo Canyon spectrum" were based on the recommendations of the NRC Staff's expert consultant, the late Dr. N. M. Newmark. Although Dr. Newmark's recommendations were based in part on engineering analyses that had been made by him and others in an attempt to understand and explain the results of observations and measurements of the behavior of structures subjected to seismic motions, the quantitative reductions recommended by him were based chiefly on his judgment and experience and only secondarily on the results of those analyses.

Although the state of the art has advanced considerably since Dr. Newmark made his recommendations, we do not believe that scientific or engineering analyses exist today that could be used to calculate the specific quantitative reductions in free-field seismic spectra that he recommended for the Diablo Canyon Nuclear Power Plant.

With regard to the question in your letter of September 8, 1983, the reduction attributed to the "tau effect" was only one element in a complex process leading to the development of design bases and criteria for the reevaluation of the Diablo Canyon Nuclear Power Plant for the Hosgri earthquake. Although each of these elements had been reviewed exhaustively by an

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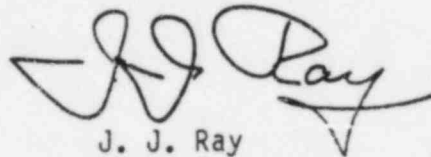
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ACRS Subcommittee and by the full Committee, the Committee in its July 14, 1978 letter chose not to comment on or endorse the individual elements of the seismic design bases and criteria proposed by the NRC Staff. Instead, the Committee concluded only that "the use of the Staff approach leads to an acceptable level of safety in this instance." For the present Committee to do more would require essentially a new evaluation of the tau-effect issue, both to accommodate those current members who did not participate in the previous reviews and to refresh the memories of those who did. To perform such a review would require a major expenditure of time and resources by both the Committee and the NRC Staff. We do not propose to undertake such a review without further direction.

We do, however, call your attention to the penultimate paragraph in the ACRS letter of July 14, 1978 on the Diablo Canyon Nuclear Power Plant, which suggested "that the seismic design of Diablo Canyon be reevaluated in about ten years taking into account applicable new information."

Dr. Forrest J. Remick did not participate in the Committee's deliberations regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "J. J. Ray". The signature is stylized with large, sweeping loops and a long horizontal stroke at the end.

J. J. Ray
Chairman