

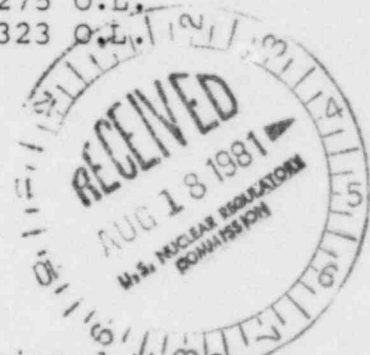
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION



In the Matter of:)
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)
PACIFIC GAS & ELECTRIC)
COMPANY)
(Diablo Canyon Nuclear)
Power Plant, Units 1 & 2)
)
)

Docket Nos. 50-275 O.L.
50-323 O.L.



SUPPLEMENT TO JOINT INTERVENORS'
PETITION FOR REVIEW OF ALAB-644

On July 6, 1981, the Joint Intervenors petitioned the Commission to review ALAB-644, the Atomic Safety and Licensing Appeal Board ("Appeal Board") decision ruling that the Diablo Canyon Nuclear Power Plant ("Diablo Canyon") satisfies the Nuclear Regulatory Commission's ("NRC") seismic design criteria in 10 C.F.R. Part 100, Appendix A. The petition for review asserts inter alia that the Appeal Board erred in failing to reopen the proceeding for the purpose of receiving testimony on the United States Geological Survey ("USGS") Open File Report 81-365.^{1/} This supplement brings to the Commission's attention new information relating to that matter. The Joint Intervenors learned, less than one week ago,^{2/} that Dr.

^{1/} USGS Open File Report 81-365, "Peak Horizontal Acceleration and Velocity from Strong Motion Records Including Records from the 1979 Imperial Valley, California Earthquake" (March, 1981).

^{2/} On Friday August 7, 1981, Joint Intervenors' Counsel learned in a telephone conversation with nuclear consultant, Richard Hubbard, that Dr. Boore had testified at the San Onofre licensing proceedings. On Monday, August 10, Counsel visited the public documents room to review the transcripts then available.

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David Boore, a USGS scientist and a principle co-author of Open File Report 81-365, was subpoenaed and testified at the licensing hearings on Southern California Edison Company's application for licenses to operate Units 2 and 3 of the San Onofre Nuclear Generating Station.^{3/} That testimony confirms that the results presented in Open File Report 81-365 are especially significant to this proceeding and that the Appeal Board erred in refusing to reopen the record to receive this new information.

Dr. Boore's testimony confirms the following points:

1. The available data shows no tendency for peak acceleration to saturate with magnitude and, instead, show that peak accelerations can be expected to increase as magnitude increases.^{4/} This contradicts

^{3/} In the Matter of Southern California Edison Company, et al. (San Onofre Nuclear Generating Station, Units 2 and 3) Docket Nos. 50-361-O.L. and 50-362-O.L.

^{4/} In a revision to Open File Report 81-365, Boore and Joyner state:

"We do not propose use of the prediction equations beyond the magnitude limits of the data set, 7.7 for peak acceleration and 7.4 for peak velocity, but we do note that Figures 3 and 8 show no tendency for either peak acceleration or peak velocity to saturate with magnitude. We do not believe that a valid basis now exists for specifying the behavior of peak acceleration and velocity at magnitudes beyond the limits of our data set. Although it might be argued that peak acceleration and peak velocity should saturate for the same reason that the body-wave magnitude scale saturates, we are not aware of any careful analysis supporting this argument. We consider the question open."

Boore and Joyner, "Peak Horizontal Acceleration and Velocity from Strong Motion Records Including Records from the 1979 Imperial Valley, California Earthquake." (Attached). This revision of Open File Report 81-365 was prepared to respond to comments received on the Open File Report and to prepare the paper for publication in the Bulletin of the Seismological Society of America. It was introduced into evidence

the Appeal Board finding that "...the data on peak ground motion that have been presented in these proceedings (i.e., Hanks-Johnson figure and its modifications) provide a convincing case for the concept of magnitude saturation. Put another way, we find that in the near field, peak high frequency ground motion is largely independent of earthquake magnitude."^{5/} This Appeal Board finding is an essential element in its conclusion that the response spectrum for a 6.5 Ms earthquake can be taken to represent the response spectrum for the 7.5 Ms Hosgri earthquake.^{6/} Dr. Boore's testimony is additional support for the Joint Intervenors' position that (1) the Appeal Board's

(footnote cont.) at the San Onofre hearing. The revised report's conclusions are essentially the same as those in 81-365. The most significant change is that the revised report examines the question of magnitude saturation in much greater depth than Open File Report 81-365. In addition, Dr. Boore has revised his estimates of peak accelerations for Ms = 7.5 earthquakes by reducing them 5%. Even when this small reduction is taken into account, the values recommended in the revision for mean and mean plus-one-standar-deviation estimates of peak accelerations for Ms = 7.5 -- 0.72g and 1.33g, respectively -- are substantially greater than the values endorsed by the Applicant witnesses. See discussion infra at 4.

5/ ALAB-644, Slip Op. 50. The Hanks and Johnson article on which the Appeal Board places so much reliance was published in 1976. A recently completed update on that work concludes that peak acceleration are magnitude dependent, and not magnitude independent. This publication was brought to the Appeal Board's attention in the Joint Intervenors' motion to reopen. The Appeal Board failed to confront this new information in ALAB-644, and instead relied on out-dated conclusions. See Affidavit of James N. Brune, dated May 22, 1981, at ¶5 and Attachment-Hanks and McGuire, "The Character of High Frequency Strong Gound Motion," submitted to the Appeal Board by letter from David S. Fleischaker, dated May 22, 1981.

6/ ALAB-644. "Our previous findings regarding near field saturation of peak acceleration with magnitude (see pp. 42-52, supra) suggest that the Pacoima Dam record is characteristic of the strongest horizontal motion in the near field of any large earthquake. Slip Op. at 74.

findings on magnitude saturation are not supported by the data and (2) peak accelerations can be expected to increase substantially as earthquake magnitude increases from $M_s = 6.5$ to $M_s = 7.5$.

2. Open File Report 81-365 (and the revised draft)^{7/} recommend a mean-plus-one-standard deviation peak acceleration value for $M_s = 7.5$ that is substantially higher than the value used to anchor the Newmark Response Spectrum.^{8/} The value selected to anchor the Newmark Spectrum is 0.75g. In contrast, the USGS authors recommend a mean-plus-one-standard deviation value of 1.33g.^{9/}

In sum, new information is available from the NRC Staff's own consultants in this proceeding, the USGS. That information is directly relevant to the seismic issue in this proceeding, and it requires conclusions different from those reached by the Licensing Board and the Appeal Board. The rule of law requires to Commission to reverse the Appeal Board and direct the record to be reopened to take evidence on Open File Report 81-365.

^{7/} See n. 4 supra at 3-4.

^{8/} NRC Staff practice is to require a mean-plus-one-standard-deviation spectrum to represent the design response spectrum, and not a mean response spectrum. See Reg. Guide. 160. This is consistent with Appendix A which requires that the design response spectra correspond "to the maximum vibratory accelerations at the elevation of the foundations of the nuclear power plant structures." (emphasis added). 10 C.F.R. §100, App. A(vi)(a).

^{9/} The Appeal Board relies on the concept of "effective acceleration" to explain the discrepancy between acceleration values reflected in Newmark spectrum and the higher values recommended by USGS Circular 672 and now re-confirmed by Boore and Joyner's most recent work. ALAB-644, Slip Op. at 60-7. However, as noted in the Petition for Review, the Appeal Board's reliance on that concept is misplaced. Petition for Review at 9-10.

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Respectfully submitted,

DAVID S. FLEISCHAKER, ESQ.
1735 Eye Street, N.W., #709
Washington, D.C. 20006
(202) 638-6070

By

David S. Fleischaker
DAVID S. FLEISCHAKER

Attorney for Intervenors
SAN LUIS OBISPO MOTHERS FOR PEACE
SCENIC SHORELINES PRESERVATION
CONFERENCE, INC.
ECOLOGY ACTION CLUB
SANDRA SILVER
GORDON SILVER
ELIZABETH APFELBERG
JOHN J. FORSTER