

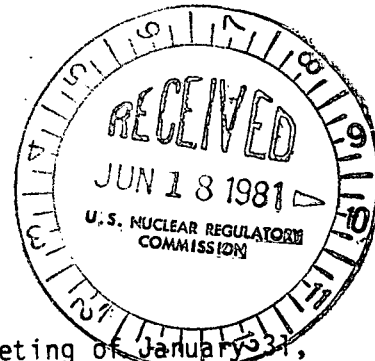


UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
 WASHINGTON, D. C. 20555
 February 3, 1981

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MEMORANDUM TO: Myer Bender
 Richard Savio
F. Rossitto
 FROM: George A. Thompson, ACRS Consultant
 SUBJECT: SEISMIC ISSUES REGARDING SAN ONOFRE



Based on the review of data and on the Subcommittee meeting of January 31, 1981, I believe that the Staff position outlined in the SER is adequate and conservative. I will comment on four points; namely, the Cristianitos fault, possible connections of this fault to the Offshore Zone of Deformation (OZD), potential for activity of the OZD, and seismic focusing.

Because old faults like the Cristianitos are sometimes reactivated, an understanding of the present tectonic setting and stress regime is extremely important. Briefly, the Cristianitos is a normal fault involving east-west extensional strain unaccompanied by horizontal shear. The western, or down-drop side partly bounds a depositional sedimentary basin, formed prior to about 4 million years ago. The modern San Andreas fault came into being about 4 million years ago and the stress field changed to one of compression. The modern stress field is directly evident: (a) by focal mechanisms of small earthquakes studied by Biehler; (b) by warping of the marine terraces along east-west axes; and (c) by much regional data. Thus, the Cristianitos fault is unfavorably oriented in both strike and depth to suffer displacement in the modern stress field.

Returning now to a possible connection between the Cristianitos fault and the OZD, both the marine seismic data and the sea cliff exposures provide robust evidence. There is no connection with the recent activity in the OZD. Weak, older faults do seem to continue the Cristianitos trend to the OZD but are capped by the 60,000 and 125,000 year old marine terraces.

Potential for activity on the OZD has been very conservatively evaluated at magnitude 7 and design acceleration 2/3g.

Seismic focusing is a general question. The data base of observed damage and of recorded acceleration contain the result of focusing. This fact accounts for some of the scatter in observations. Modeling predicts the observations accurately for long periods, but shorter periods, in the range of interest for structures, are not significantly amplified.

In conclusion, I emphasize that the review has been exceptionally thorough and that the SER expresses a sound position.

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