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

February 3, 1981

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Mr. Myer Bender, Chairman
Subcommittee on San Onofre 2&3
US Nuclear Regulatory Commission
Advisory Committee on Reactor Safeguards
Washington, D.C. 20555

SUBJECT: SUBCOMMITTEE MEETING JANAURY 31, 1981, AIRPORT PARK HOTEL, LOS ANGELES, CALIFORNIA

Dear Mr. Bender:

As requested, I will comment on three aspects of the geology and seismology of the site area and surroundings:

1. Is the Cristianitos fault related to the offshore "Cristianitos fault system"?

   Offshore seismic profiling by Nekton, Inc. and other contractors reveals several small faults approximately parallel to the strike of the onshore Cristianitos fault zone and extending southward to the vicinity of faults considered to be a part of the Offshore Zone of Deformation (OZD). Two major questions are posed: (1) Is the Cristianitos "offshore system" connected to the OZD?; (2) if so, would motion on the OZD be translated into motion on the Cristianitos onshore fault? The onshore Cristianitos fault zone has been explored extensively by trenching, and a major strand of the fault is well-exposed in the sea cliff to the south of the plant site. Where exposed, the fault dips westerly and appears to be a normal fault down to the west. This fault is truncated by, and is clearly older than, the wave cut bench which has been dated at approximately 120,000 years. The offshore "Cristianitos system" faults do not cut the bottom sediments. Many of these CZD offshore faults appear to have moderate dips also and, therefore, are probably of dip-slip origin, but vertical exaggeration in the seismic profiles makes a determination of dip difficult. The USGS mapping indicates the offshore Cristianitos system faults strike toward a long stretch of continuous sea cliff containing the well-exposed Cristianitos onshore fault. Faults of the offshore zone do not connect with the Cristiantios onshore fault nor cut the well explosed sandstone of the sea cliff on either side that fault. It is, therefore, not certain whether the Cristianitos onshore fault and "Cristianitos system" are directly related. Neither appears to have been active in Holocene time, however. Furthermore, movement on the Cristianitos fault is incompatible with right-lateral strike-slip motion assumed to characterize the OZD.

   Summary: The Cristianitos fault and "Cristianitos offshore system" apparently have not been active in Holocene time. There is no evidence of continuity between these two systems and the expected direction of motion on the OZD should not result in the renewed displacment of the Cristianitos fault.

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2. What is the effective length of the OZD? The Newport-Inglewood trend of oil-producing faulted anticlines reflects a true-going, right-lateral, strike-slip fault at depth. Offshore to the south, similar faulted and anticlinal structures have been identified seismically, as well as a discontinous network of mostly southeasterly-trending faults cutting surface and near surface sediments. This general trend continues southward approximately to San Diego Bay, where the zone changes direction from southeasterly to southwesterly and from strike-slip to normal fault displacement. Between the north end of the Newport-Inglewood fault trend to San Diego, there are large gaps in the continuity of known faults cutting surface sediments. Additional faults appear in deeper sections, and in the acoustical basement a network of faults of varying additudes seems to be essentially continuous over a width of about 15 km. It is reasonable to interpret this zone as a resultant of right-lateral strike-slip movement along a deeper fault, but movement on the individual strands could be strike-slip, thrust, or normal faulting in an overall right-slip strain field. The OZD probably ends in the vicinity of San Diego, as indicated by both Staff and consultants. Postulated continuation across Baja, California or alternatively to offshore faults west of the peninsula, cannot be demonstrated, and from the geometry does not appear to be likely. The northern limit of the OZD is the east-west zone of faulting at the base of the Santa Monica hills. The maximum effective length is therefore about 200 km. As I mentioned in the course of the hearing, however, I do not see direct evidence of the true-going strike-slip fault within or beneath this system, and for this reason regard the assumption of continuity over the 200 or so km length of the OZD to be highly conservative.

3. Focusing: Focusing of seismic energy was discussed briefly at the Subcommittee meeting. It appears to be a complex and little understood phenomenon that can arise in various circumstances. It was postulated by Mr. Barlow, an intervenor, that a movement along the OZD might be translated to focus seismic energy along the Cristianitos fault zone close to the plant site. As indicated above this is highly unlikely, both because of the differing strain history of these two zones and because the last observable motion on the Cristianitos occurred 120,000 years or more ago. Aside from this, I have no comments on the phenomenon of focusing.

In conclusion, I think the Staff should be congratulated on the preparation of this SER. It is well organized, lucid, succinct document and a pleasure to read.

Sincerely,

J Bessette for
John C. Maxwell
ACRS Consultant

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