

JAN 5 1976

Docket Nos 50-275 and 50-323

Roger Boyd, Acting Director, Division of Reactor Licensing
DIABLO CANYON

We strongly recommend that immediate meetings be held with upper management to initiate actions to promptly develop a firm basis for making a decision on Diablo Canyon. Our preliminary thoughts are provided in the enclosure.

Original signed by R. C. DeYoung

R. C. DeYoung, Assistant Director
for Light Water Reactors Group 1
Division of Reactor Licensing

Enclosure:
Diablo Canyon Geology-
Seismology

cc w/enclosure:
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DIABLO CANYON GEOLOGY-SEISMOLOGY

I. GEOLOGY-SEISMOLOGY SITUATION

Based on USGS draft report, Renner Hofmann's assessments to date, as discussed with Dennis Allison, and the meeting of December 30, 1975, between the staff and USGS, we understand the geology-seismology situation is as follows:

1. USGS believes that the 1927 event might have occurred on the Hosgri Fault so we should place a magnitude 7.0 to 7.5 earthquake on that fault. The published magnitudes for the 1927 event are in that range. This would lead to a calculated peak acceleration much higher than 0.5g using standard methods.

The USGS position is suspect. Renner Hofmann of the staff has reviewed the felt effects of the 1927 event and they seem to be very good data. In all respects they demonstrate that the 1927 event was either much farther out to sea or was much smaller. Either way, the plant, which is adequately designed for 0.5g using standard techniques, could take the effects of this earthquake when it is moved in an appropriate manner.

We do not have a direct verification of the magnitude determination at this time. Renner Hofmann has reviewed the location data, which indicate that the 1927 event was or could be on the Hosgri Fault, and considers them to be of very poor quality, capable only of determining the location to be somewhere off the coast of Central California.

The USGS expressed a willingness to take another look at this aspect of the geological situation taking into account Renner Hofmann's and Carl Stepn's comments made at the meeting on December 30, 1975.

2. The USGS believes that the Hosgri Fault is more than 90 miles long and may even be coupled with the San Simeon Fault at the northern end of the Hosgri Fault. This is a somewhat incongruous statement because it appears that one must add the San Simeon fault length to the Hosgri Fault on the north, as well as a few miles on the south, in order to get a 90-mile length. Nevertheless, what we believe they are saying is that other interpretations

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than the applicant's can be placed on the geological evidence of fault length. Furthermore, with these other interpretations, the fault length is unknown, except that it is greater than 90 miles.

It is not at all clear where we are going here. This is a question we must deal with even if USGS is convinced of our position with respect to item 1 above. Unfortunately, we do not have a specific earthquake recommendation from USGS based on fault length to deal with.

Renner Hofmann is looking at the seismic profiles but the USGS opinion (that another interpretation is possible) will probably hold water. Perhaps the fault length could be limited to 90 miles or a little more with additional field work. A fault length of up to 120 miles would give a 0.5g peak acceleration, assuming mostly strike slip motion and a rupture length of one half the fault length. We feel that there are reasonable assumptions for this site, but the USGS may well disagree.

3. USGS believes that the standard methods of calculating a peak acceleration and scaling a spectrum to it are not appropriate this close to large earthquakes. While they do not know what would be appropriate, they clearly invite us to find a better way.

Renner Hofmann is working on two approaches which can shed some light on the subject and may indicate that the plant could take a large earthquake on the Hosgri Fault. One approach is to place the magnitude 8.3 San Francisco earthquake on the Hosgri Fault and use the felt effects to estimate the peak accelerations. The second involves calculations of peak acceleration based on the fact that only the energy released in about four miles of fault length will contribute to the peak acceleration at a distance of four miles from the fault. This type of reasoning could possibly provide a rationale for reconciling the differences of opinion with which we are dealing.

4. The quality of the USGS recommendation, as far as we can tell at this time, is poor.

- a. Their specific recommendation to place a magnitude 7.0 to 7.5 earthquake on the Hosgri Fault is based on an idea which we consider not valid. However, USGS has agreed to consider this matter further in light of our comments to them.

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- b. Their recommendation does not deal with a magnitude based on fault length, which must be dealt with. Indeed, they do not say that item a above is a worst case or design case, but neither do they say that there might be a worse case. We need something better than this to work with.
- c. It seems that we are dealing with the opinion of one to four people and we are not sure which ones. For example, one of these persons (Holly Wagner) is highly respected but we do not even know what he thinks, much less what a consensus of top geologists would be. As another example, Hanks, a Cal Tech professor and part-time USGS employee, published an article stating that the 1927 earthquake was not on the Hosgri Fault, but we have no indication of whether or not this was given any weight. This is not an adequate base for a decision as important as this and is, in our opinion, the best USGS can give us.
- d. Holly Wagner is the highly respected geologist making the geological interpretations, yet we have been unable to discuss the matter with him. All we have gotten is second-hand word that good people have reviewed it and this is what they said, without meaningful discussion of the technical reasons.

II. RECOMMENDATION AT THIS TIME

Clearly we can benefit from further discussions with USGS at a lower level before they send their formal recommendation. However, in light of the serious nature of the decision we must make, the unknown quality of the USGS recommendation and the extra difficulty involved in reversing a USGS opinion after it is published, we recommend contacting top management at the Department of Interior and expressing our need for an immediate accelerated reevaluation of the geologic situation, including:

1. The independent opinions of several top USGS geologists not heretofore directly involved in the Diablo Canyon review.
2. A clear expression of the technical reasoning which can be discussed meaningfully with the staff.

In addition, we should immediately retain additional top geologists directly as consultants and initiate further independent review on our own. Depending on which how quickly we take action, the results may or may not be completed in time to support the schedule for licensing.

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III. POSSIBLE FUTURE OPTIONS

If we receive the USGS recommendation as it stands now, we will have three basic options, assuming that we will publish the SER Supplement and take a position instead of asking further questions and slipping the schedule. The three basic options are:

1. Oppose the operating license. Leave the door open for further study, etc. Describe why.

We have a poor basis for this action at this time, other than general conservatism and "PG&E hasn't done enough to make everyone happy." Such arbitrary conservatism would not be an adequate basis in this case because of the large financial loss involved and the severe impact such action would have on the nuclear industry.

2. Favor the operating license. Require further study, etc. Describe why.

- a. If this is done on the basis of rejecting the USGS recommendation because it is poor, there would be difficulty justifying the action.

- b. Alternately, we could possibly accept the USGS advice and justify the action on the basis of probabilities of earthquakes and structural and mechanical damage (treating it as an exception to Appendix A to Part 100). This would probably be coupled with requirements for plastic structural analysis, backfit, further geological study, etc., within specified time periods. There would be some difficulty in justifying this approach also.

3. Neither oppose nor favor the operating license. Describe the situation.

Although the ACRS, Hearing Board, Commission, and courts will probably all have to decide this case anyway, it is not satisfactory for us to go to them without a recommendation.

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