MAY 13 1976

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

Mr. James A. Mack
7359 Breen Street
Niles, Illinois

Dear Mr. Mack:

Your letter to Chairman Anders dated March 30, 1976 concerning the seismic design of the Diablo Canyon Nuclear Plant has been referred to me for response. As you know, the Diablo Canyon operating license application is still pending before the Atomic Safety and Licensing Board. Since any decisions and rulings by the Licensing Board are subject to review by the Commissioners, it would be inappropriate for the Chairman to respond to inquiries regarding matters involving the record of that hearing. Accordingly, as an attorney assigned to that case, I am pleased to respond to your letter.

You expressed concern about the Diablo Canyon plant's ability to withstand an earthquake similar to the 1927 event if one should occur on the Hosgri fault. You also stated that the Commission should not issue an operating license until the appropriate actions to strengthen the plant have been taken. I would like to assure you that this matter is being carefully considered by the Staff.

The evaluation of the operating license application has been delayed by about two years due to considerations associated with the Hosgri fault. The U.S. Geological Survey and the Commission's Staff have now concluded that an earthquake of magnitude 7.5 could occur on the Hosgri fault. Pacific Gas and Electric Company is currently performing an analysis to determine what modifications will be necessary to withstand such an earthquake. The first enclosure, "Diablo Canyon Seismic Design Evaluation" provides further details concerning the overall evaluation. The second enclosure, a report from the U.S. Geological Survey, discusses the earthquake potential of the Hosgri fault in detail.

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The Commission's regulations set forth procedures which result in the safety related portions of a nuclear power plant being designed to withstand the largest earthquake that can be expected to occur at the plant's location in an indefinitely long period of time. The safety related portions include not only the components which contain significant amounts of radioactivity, but they also include the features which, in the event of a postulated significant accidental release from those components, function to contain the radioactivity and limit releases to the environment to acceptable values. Thus, nuclear power plants are designed such that an earthquake cannot be expected to result in a significant release of radioactivity to the environment. Since these procedures apply to the Diablo Canyon plant, an operating license can not be issued until all actions necessary to assure an acceptable level of safety have been taken. To this end, the NRC Staff will publish a special safety evaluation report sometime this summer setting forth with particularity the results of the investigations and calculations of the numerous parties who have investigated the matter.

I hope that this information will be of benefit to you. If you have any further questions, please do not hesitate to contact me.

Sincerely,

/s/

James R. Tourtellotte
Assistant Chief Hearing Counsel

Enclosures:
1. "Diablo Canyon Seismic Design Evaluation"
2. U.S. Geological Survey Report

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ENCLOSURE

DIABLO CANYON SEISMIC DESIGN EVALUATION

The Diablo Canyon Nuclear Power Plant is located on the Pacific Coast about 12 miles from San Luis Obispo, California. Construction is essentially completed for the first of the two units at this site. The owner, Pacific Gas and Electric Company, applied for an operating license in 1973. The Commission's staff is currently evaluating the operating license application. This evaluation, which is now nearing completion, has been delayed about two years by considerations associated with the Hosgri fault.

The present situation presents no risk to public safety since the reactors have never operated and do not have operating licenses. New fuel for the reactors is being stored at the plant. The Commission's staff has evaluated this storage and determined that it involves no significant risk to public safety even if the largest of earthquakes should occur. This conclusion was affirmed by the Atomic Safety and Licensing Board following public hearings on the matter.

Before operating licenses can be issued, all actions necessary to demonstrate an acceptable level of safety will be required. Further details concerning the operating license evaluation are presented below.

Construction permits were issued in 1968 and 1970 for Units 1 and 2, respectively, at the Diablo Canyon site. Based on the investigations conducted at that time the plant was designed to withstand the following earthquakes:

(1) A great earthquake of magnitude 8.5 along the San Andreas fault 48 miles from the plant.

(2) A major earthquake of magnitude 7.25 along the Nacimiento fault 20 miles from the plant.

(3) A major earthquake of magnitude 7.5 along the off-shore extension of the Santa Ynez fault 50 miles from the plant.

(4) An aftershock of magnitude 6.75 not associated with a known fault 6 miles from the plant (directly under the plant at a depth of 6 miles).

After the construction permits were issued, offshore investigations conducted by Shell Oil Company showed the existence of a fault which had previously been unmapped. This is the Hosgri fault which runs

offshore from the vicinity of Point Sal on the south to Point San Simeon on the north and passes within about 3 1/2 miles of the Diablo Canyon Nuclear Power Plant at its closest approach. (One small splay of the fault passes within 2 1/2 miles of the plant).

Since the beginning of the operating license review, Pacific Gas and Electric Company has conducted additional investigations and submitted extensive information on the characteristics of the fault, its capabilities for producing earthquakes and the ability of the plant to withstand earthquakes which are more severe than those considered in the original design. The Company has proposed considering the Hosgri fault capable of producing an earthquake of magnitude 6.25. Since this earthquake would result in somewhat more severe ground shaking than the original design earthquakes, the Company has performed additional analyses in order to demonstrate that the plant could safely withstand such an earthquake.

The U. S. Geological Survey, which is acting as a consultant to the Commission's staff in this review, has also conducted extensive investigations concerning the characteristics and capabilities of the Hosgri fault. The Survey has recommended considering the Hosgri fault capable of producing a larger earthquake than the magnitude 6.25 earthquake proposed by Pacific Gas and Electric. This general recommendation was made by the Survey and published by the Commission's staff in January 1975. In April 1976, after considerable further study, the Survey made a specific recommendation that the Hosgri fault should be considered capable of producing an earthquake with a magnitude of 7.5. This recommendation is based on the opinion that the fault is longer than Pacific Gas and Electric Company believes it is or, alternatively, that the 1927 earthquake of magnitude 7.3 could have occurred on the Hosgri fault.

Accordingly, the Commission's staff has concluded that the plant's seismic capability must be reevaluated in light of the magnitude 7.5 earthquake. The staff has also set forth the criteria and procedures that should be used since the analysis for an earthquake of that magnitude at this distance from the plant will be unique in several respects. Pacific Gas and Electric Company is currently performing the analysis to define what modifications will be necessary. When the analysis is completed it will be reviewed by the Commission's staff and its consultants.

In addition to its own technical expertise in the fields involved here, the Commission's staff has the assistance of capable consultants, including the U. S. Geological Survey. Furthermore, when the staff's evaluation is completed these matters must be considered by other bodies before an operating license can be issued. They will first be evaluated by the Advisory Committee on Reactor Safeguards. Then the Atomic Safety and Licensing Board will hold public hearings near the plant site. At these hearings the Board will consider the evidence and recommendations presented by Pacific Gas and Electric Company, the Commission's staff, the Advisory Committee on Reactor Safeguards and other parties, including the State of California and interested citizens, before making a decision concerning an operating license. This decision will then be reviewed by the Atomic Safety and Licensing Appeal Board.

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

APR 29 1976

Mr. Benard C. Rusche
Director of the Office of Nuclear
Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Rusche:

Transmitted herewith, in response to your request, is a review of the geologic and seismologic data relevant to the Diablo Canyon Nuclear Power Station, Units 1 and 2 (NRC Docket Nos. 50-275 OL and 50-323 OL).

This review was prepared by F. A. McKeown and J. F. Devine of the U.S. Geological Survey. Mr. McKeown was assisted by Holly Wagner, David McCulloch and Robert Yerkes in the preparation of portions of this review. Mr. Devine was assisted by Robert Page and Wayne Thatcher in the preparation of portions of this review.

We have no objection to your making this review part of the public record.

Sincerely yours,

Henry W. Coulter

Acting Director

Enclosure

PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON SITE, UNITS 1 AND 2
SAN LUIS OBISPO COUNTY, CALIFORNIA
AEC DOCKET NOS. 50-275 AND 50-323

Geology and Seismology

This is a review of the geological and seismological information contained in Amendments 31, 32, 34, 37 and 40 of the Final Safety Analysis Report (FSAR) for the Diablo Canyon nuclear power plant site. The review also includes a discussion of questions concerning the size of an earthquake to be expected on offshore fault zones raised by some California scientists since review of the amendments.

The amendments were prepared by the Pacific Gas and Electric Company (PG&E) in response to a request in a letter dated February 12, 1975, from the Nuclear Regulatory Commission (NRC) for certain additional information relevant to design basis earthquake issues, which have been the principal problems requiring additional earth sciences information and analyses. To support assertions in the FSAR through Amendments 11, 19, and 20, five requests for information (referred to as questions in the Amendments) were made.

2.17. Provide additional discussion and arguments for determining the maximum earthquake that can be expected on faults of various ranks within the San Andreas system. Relate the discussion to historic seismicity.

2.18. Provide additional documentation, including seismic reflection profiles, on the intersection of the Hosgri fault zone with the Transverse Range faults. Include geologic maps southward of those provided in the FSAR showing the structural relationships of the Transverse faults and structures having a northwest trend.

2.19. Provide additional documentation, including seismic profiles, on the northern reaches of the Hosgri fault zone. Include a fuller development of your views on the structural relationship of the Hosgri fault to the San Simeon fault.

2.20. Provide additional information on the location of the 1927 event, together with its probable mechanism. Discuss probable relationships of this event to the geologic structure in the region.

2.21. Provide your evaluation of the maximum credible earthquake on the Hosgri fault zone. Assuming this event occurs along the segment of the Hosgri fault zone nearest the site, evaluate its response spectrum at the site and compare it with the design response spectrum.

The response in the FSAR to the questions has provided considerable additional geologic and seismologic information and analyses. Many uncertainties in the data and interpretations still exist. Among the most important of these are: (1) the location and mechanism of the 1927 earthquake, (2) the exact relation of the Hosgri fault zone to faults in the Transverse Range system and the San Simeon fault, (3) the continuity of some faults, (4) the relative amounts of dip-slip and strike-slip movement on the Hosgri fault zone, (5) the sense of displacement on parts of the Hosgri zone, (6) identification and correlation of acoustical units, and (7) kinematic relations among different fault zones.

In addition to these uncertainties, some information shown on the profiles is not shown on the maps and vice versa, and some profile data are not included that are important to evaluate the extension or character of some faults. Because geologic maps developed from seismic reflection profiles are based upon much interpretation that may differ among several interpreters, it was necessary for the purposes of our

review to make independent interpretations of the seismic profiles. These independent interpretations are somewhat different than the interpretations presented in Amendments 31 and 32. The major differences are briefly described in appropriate sections of this review.

Although some changes in, and additions to, geologic and seismologic details have been made in Amendments 31, 32, 34, 37 and 40 compared with previous data in the FSAR, no major changes can be made in our conclusions that were stated in the review of the FSAR, and Amendments 11, 19, and 20, which was transmitted to the NRC from the Director of the United States Geological Survey by letter of January 28, 1975. The pertinent statement in our previous conclusions was as follows: "Earthquakes along the EBZ[1] presumably would not be as large as expected on the San Andreas fault, however, from the information presently at hand we can find no evidence that would preclude the occurrence of an earthquake as large as events characteristic of subparallel strike-slip faults, which bound basins, such as the Santa Maria, in the San Andreas system and which do not transect structural provinces." The size of an earthquake on faults that bound basins was not specified in this conclusion. For reasons stated in subsequent parts of this review, however, the magnitude of the design basis earthquake for the Diablo Canyon nuclear reactor site should be about 7.5 and located on the Hosgri fault zone. This is based principally on the fact that the November 4, 1927, earthquake had a magnitude of

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[1]As defined in the FSAR, EBZ refers to the East Boundary fault zone, which is the Hosgri fault zone.

7.3 and that the best estimates of its location indicate that it could have occurred on the Hosgri fault. Furthermore, the range in magnitude is compatible with the largest recorded or estimated magnitudes of earthquakes that have occurred on subsidiary faults in the San Andreas system.

Selected comments important to an evaluation of the amendments are outlined below.

Amendment 31

NRC Question 2.18

On figures 8 and 9 relative displacement on the Hosgri fault between Point Buchon and Point Sal is shown to be down on the east. On figure 10 relative displacement on the southern extension of the Hosgri fault south of Point Sal is down on the west, which is compatible with the argument that the Hosgri fault is the east boundary of a portion of the Santa Maria Basin. Changes in direction of relative movement, however, are very suggestive of lateral displacement, which may have occurred after development of the basin and bounding faults.

On page 9, reference is made to figure 11 as evidence that no scarp-forming seismic events have occurred on the southernmost part of the Hosgri fault since prior to the Wisconsinan stage of the Pleistocene. It is true that no offset of the ocean floor is evident on figure 11. However, close inspection of figure 11 shows offset of the post-Wisconsinan unconformity when sighting along it or placing a straightedge along the mapped trace. Also, faulting of the post-Wisconsinan sediments cannot be precluded because a change in acoustical

signature is evident across an upward projection of the fault shown in figure 11. The change in the acoustical signature of unit A2 across the fault is quite clear and may be evidence of lateral movement on the fault.

It is not clear from the profiles in figures 13a and 13b that the disturbed zones in them that are inferred to represent the West Hosgri fault are the same. At least three additional faults can be interpreted in the profile of figure 13b. Also a disturbed zone appears to be between stations 133 and 136 in the profile of line 13a. Kelez, Bartlett, and Polaris survey lines crisscross this area and evidence from them to support or negate the suggested correlation of disturbed zones is not apparent.

An independent interpretation of the seismic profiles in the offshore area from about Point Sal to about five miles south of Point Arguello indicates that the Hosgri fault extends at least five miles south of Point Arguello and does not turn eastward as suggested in Amendment 31.

Although the Lompoc fault zone appears to have offset the sea floor, and may, therefore, be considered capable of movement again, its length of only about eight miles as inferred by the applicant appears to be incompatible with a magnitude 7.3 earthquake. An independent interpretation of the seismic profiles in the area of the Lompoc fault differs from that of the applicant in that it shows that the Lompoc fault zone is about 20 miles long; the longest single fault in the zone is about 15 miles in length. Furthermore, the displacement

is interpreted to be dip slip or possibly oblique slip; rather than reverse slip as suggested by the applicant.

NRC Question 2.19

As noted in the previous section, the sense of displacement on the southern part of the Hosgri fault is up on the west side, figure 1 (N), and therefore is not compatible with its being primarily related to basin development. However, an alternative interpretation suggests the displacement on the Hosgri fault in figure 1 to be down on the west.

Figure 1 (N) has three buried faults not shown on Plate I. This leads to questions concerning the interpretation of some of the data in the report.

Another instance of faults shown in profile but not on a map is seen from comparison of figure 4 (N) and Plate I. The correlation of faults between Lines 16 and 12 (figures 3 (N) and 4 (N)) is questionable. A profile along Line 14 would help. Also, an interpretation of Line 10 should be included.

Although the straight coast line between Cambria and Point Estero suggests that the extension of the San Simeon fault is just offshore; data are lacking to prove this. None of the data presented in Amendment 31 preclude the San Simeon fault from intersecting the Hosgri fault offshore between Cambria and Point Estero. The two faults even as shown on Plate II (N) are less than 2.5 miles apart and could very well be tectonically coupled to each other by an en echelon or anastomosing series of faults which is characteristic of faults in the coast ranges. Such coupling of the Hosgri and San Simeon faults is supported by

interpretation of stratigraphic sections recently reported by Hall (1975). He infers that "...the San Simeon and Hosgri faults are part of the same system,..." and that 80 km or more of right slip has occurred along the system during the last 5 to 13 million years.

Figures 7a (N) and 7b (N) are very puzzling. They show an inflection in the sea floor over the Hosgri fault and a drastic change in the thickness and acoustical signature of unit A2, assuming A2' is correlative with A2. In addition to vertical displacement, lateral displacement, which is not mentioned, could be interpreted from these profiles. However, the basis for separating A2' from A3 is not apparent. Similarly, it is not apparent why unit A', east of the fault, is terminated. It appears to continue to the east edge of these profiles.

On figure 11a (N) the A2 unit east of the fault at station 119. is correlated with the Monterey formation (p. 8, NRC Question 2.19, Amendment 31), but the signature of the A2 unit west of this fault is completely different. This inferred lithologic change, as elsewhere, suggests lateral displacement.

NRC Question 2.20

On page 10 it is reasoned that both the Hosgri and West Hosgri faults can be eliminated as sources of the 1927 earthquake because neither the sea floor nor the post-Wisconsinan unconformity are offset in the epicentral area of the earthquake. This reasoning is not satisfactory because typically surface rupturing of a fault is discontinuous, and offset may not be detected if the displacement had a

large lateral component. Furthermore, as stated on page 4 of this review, the base of post-Wisconsinan sediments is offset, and a fault in the sediments cannot be precluded in figure 11. The evidence, therefore, to eliminate the Hosgri fault as the source of the 1927 earthquake is inadequate. As previously stated, the length of the Lompoc fault appears to be incompatible with the magnitude of the 1927 earthquake.

Figure 1 shows that segments of the Hosgri fault zone, the Lompoc fault, Purisima fault, and Lion's Head fault occur within the error circle of Gawthrop and error ellipse of Engdahl for the 1927 earthquake. However, all of the faults are outside of the area designated by Smith as the "inferred distribution of aftershock sequence of the 1927 earthquake." The 1927 earthquake, therefore, cannot be unequivocally located on any one of these faults. The Hosgri fault, however, is closer to the center of the estimate of error than the other faults and, therefore, must be considered as a possible fault on which to locate the earthquake.

Amendment 32

NRC Question 2.17

Although this section contains descriptions and explanations of the "kinematics of structural behavior in the south-central California region..." contemporary seismic activity is not fully explained. Also, we do not agree with some statements given as fact. For example, on page 2 it is stated as fact that the 1927 M.7.3 earthquake occurred on the Lompoc fault. This is not fact but a highly controversial

assumption. Item 2 on page 2 of this amendment indicates that the Lompoc and San Andreas are the only faults in the southern Coast Ranges that "reflect substantial late Quaternary surface deformation." As defined on page 3 of this amendment, "substantial" clearly includes the San Simeon fault, which as stated on page 7 of this review may be coupled with the Hosgri fault. The attempt to explain the large magnitude by using the logic that the Lompoc fault is in a transition zone between the Coast Ranges and Western Transverse Ranges applies to other faults in the zone including the southern part of the Hosgri fault.

Amendment 34

NRC Question 2.21

The maximum credible earthquake of 6 1/4 - 6 1/2 on the Hosgri fault zone used in this section to derive peak site ground acceleration is unacceptable because as stated previously the 1927 earthquake with a magnitude of 7.3 cannot be precluded from having occurred on the Hosgri fault. Although we believe that the 1927 earthquake should be used to estimate the safe shutdown earthquake, fault length-magnitude relationships have also been considered. The uncertainties in these relationships and the assumptions involved in the use of them are well known. Nevertheless, we may consider that the Hosgri fault is about 90 miles (144 km) long, or even greater if it is coextensive with the San Simeon fault. The part of this total length that may rupture during an earthquake is highly conjectural, particularly in view of the complex tectonic style of the faults in question. However, using a reasonable

factor for continuous rupture along a discontinuous zone of deformation, in our judgment, it is prudent to consider magnitude 7 as a possible minimum magnitude based on this criterion above, exclusive of the consideration of the 1927 earthquake.

Recently some earth scientists in California have discussed the possibility that the Hosgri fault zone not only may intersect or be coextensive with the San Simeon fault, but that the San Simeon fault may connect with the San Gregorio fault, presumably in the vicinity of Monterey Bay. It is argued that these three faults could comprise a system that may make it capable of generating a magnitude 8 earthquake. Available data, although incomplete, do not substantiate this inferred system of faults in the sense that it is a long linear fault along which major movements are occurring and, therefore, is capable of a magnitude 8 or larger earthquake.

It is well known that earthquakes with instrumentally measured magnitudes of 8+ generally occur along major discontinuities that may be either subduction zones or transform faults. In western North America the only such discontinuity recognized is the San Andreas fault. Not only is there no record of a magnitude 8 earthquake on the offshore system, but significant differences in tectonic style exist between that system and the San Andreas fault, which strongly suggest that the great length of rupturing associated with magnitude 8 earthquakes on strike-slip faults would not occur. These differences are outlined below:

(1) As stated previously, an interpretation that the San Simeon intersects the Hosgri fault zone offshore between Cambria and Point Estero cannot be precluded. Such an intersection would permit a nearly straight line continuation of the Hosgri zone. However, interpretations by Hoskins and Griffiths, the applicant, and Wagner all show continuation of the Hosgri zone or branches of it north of any postulated intersection. If the San Simeon fault does not intersect the Hosgri zone, then they are en echelon to each other as originally interpreted by Hoskins and Griffiths. The tectonic style of this area, therefore, is one of branching or en echelon faults.

(2) Data on the relationship of the San Simeon fault to the San Gregorio fault have not been provided by the applicant nor were they requested. The Hosgri fault zone is comprised of many discontinuous, anastomosing, and en echelon faults as interpreted by both Wagner and McCulloch, and the applicant. Relationships between HSS zones appear to be similar to the style of faulting in the coast ranges: an anastomosing, en echelon pattern unlike that of the San Andreas fault

Offshore faults north of Point Piedro Blancas do not form a single continuous fault. Greene and others (1973) show the San Gregorio fault connecting with the onshore Palo Colorado fault northeast of the Sur-Nacimiento fault zone. Furthermore, the San Simeon fault if projected northwest immediately offshore is truncated by the Sur-Nacimiento zone (Crowell, 1975). These relationships appear to preclude any similarity to the continuous style of the San Andreas fault.

(3) The Hosgri zone and the San Simeon fault are considered in this review as part of the San Andreas system of faults. This interpretation is made because (a) of evidence of lateral movement along the Hosgri fault zone and the San Simeon fault, (b) these faults like coast range faults are subparallel to the San Andreas fault, and (c) the regional stress field responsible for the plate boundary movements concentrated along the San Andreas fault may reasonably be expected to cause lateral movement on subparallel faults. Much geologic and seismologic evidence, however, shows that the major plate boundary movements are occurring on the San Andreas fault. Speculation that the major movements now occurring on the San Andreas fault should transfer tens of miles to another part of the system, which is discontinuous and nonlinear, within a few decades or perhaps several hundred years cannot be supported with available geologic evidence.

(4) The Hosgri fault zone and San Simeon fault are recognized as the eastern boundaries of offshore basins with large vertical displacements. The evidence for this is compelling, and the presence of the basins is reason for exploration by oil companies. In our review we have not disputed this evidence, but argued that the displacement on these basin-bounding faults in the current stress regime may have a large component of lateral displacement should an earthquake occur on them. These faults apparently do not form crustal plate boundaries which suggest that both their length and depth are not of the order of plate boundary faults and probably would not support earthquakes as large as those that occur along crustal plate boundary faults.

The suggestion that the Hosgri-San Simeon-San Gregorio faults comprise a system capable of a magnitude 8 earthquake is a legitimate and serious question, which has been considered since discovery of the Hosgri fault zone by Hoskins and Griffiths (1971). It is our current judgment, however, based upon the data in the FSAR, data in the literature, some work in progress within the USGS, present concepts of earthquake source areas along the west coast of the U.S., and the arguments given above that such faults have not been demonstrated to be capable of generating magnitude 8+ earthquakes.

In essence the Hosgri, San Simeon, and San Gregorio faults, even if parts of a common zone of deformation, have the dominant characteristics of subsidiary faults within the San Andreas system. Such subsidiary faults have no record of or estimate of earthquakes larger than magnitude 7.5 on them.

Conclusions

Although the FSAR includes a considerable amount of new information and analysis, the only change that can be made in the original conclusions transmitted to the NRC on January 28, 1975, is to be more specific in our estimate of the design basis earthquake. This is based upon the following facts and judgments.

1. The Hosgri fault zone is more than 90 miles long and may even be tectonically coupled to the San Simeon fault as they are within 2.5 miles of each other and both form parts of the eastern boundary of the Santa Maria basin.

2. Marked changes in thickness and signature of acoustical units across the Hosgri fault zone in several profiles indicates evidence of lateral slip. This was noted in our review of January 28, 1975, but such changes are even more abundant in the profiles of Amendment 31. Right lateral movement is reported for the San Simeon fault. These data suggest that displacements on the Hosgri fault are related to the highly active San Andreas plate-boundary system.

3. The length of the Lompoc fault appears incompatible with the magnitude of the 1927 earthquake.

4. The Hosgri fault is closer to the center of the estimates of error of both Engdahl and Gawthrop than any other fault. It is therefore a possible source of the 1927 earthquake.

5. Questionable evidence related to vertical displacement on the Hosgri fault in the epicentral area of the 1927 earthquakes does not eliminate it as a source. Surface rupture is generally discontinuous, and if lateral slip occurred, it probably would not be detected. Offset of the base of post-Wisconsinan sediments and probable faulting of them is evidence of post-Pleistocene movement.

For the above reasons and discussions given in the review, we conclude that the 1927 earthquake could have occurred on the Hosgri fault and that a similar earthquake with a magnitude of about 7.5 could occur in the future anywhere along the Hosgri fault.

6. We recognize the suggestion that the Hosgri, San Simeon, and San Gregorio faults may comprise a system capable of magnitude 8 earthquakes. It is our judgment, however, that these faults are subsidiary faults within the San Andreas system and such faults have not been demonstrated to be capable of magnitude 8+ earthquakes.

7. We repeat our opinion that, for sites within 10 km of the surface expression of a fault, the description of maximum earthquake ground motion by means of a single acceleration value may not be an appropriate representation.

Consequently, we feel that an appropriate earthquake for this site should be described in terms of near-fault horizontal ground motion. A technique for such a description is presented in the Geological Survey Circular 672 entitled "Ground Motion Values for Use in the Seismic Design of the Trans-Alaska Pipeline System" (Ref. 4). It is our intention that the ground motion values as exemplified by Table 2 "Near-fault horizontal ground motion" of Ref. (4) for magnitude 7.5 be used to form the basis of a description of the earthquake postulated to have the potential for occurring on the Hosgri fault at a point nearest to the Diablo Canyon site subject to the conditions placed on these values in Ref. 4. The earthquake so described should be used in the derivation of an effective engineering acceleration for input into the process leading to the seismic design analysis.

It is intended, also, that this potential earthquake be considered in addition to all earthquakes considered previously by the applicant during the construction permit review process.

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Urges delay in granting an operating license for Diablo Canyon until actions are taken to strengthen the building against potential damage from earthquakes

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DESCRIPTION ☒ LETTER ☐ MEMO ☐ REPORT ☐ OTHER

Urges delay in granting an operating licens for Diablo Canyon until actions are taken to strengthen the building against potential damage from earthquakes

SPECIAL INSTRUCTIONS OR REMARKS

EDO?

DOCK 76-1053

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		Docket Files 50-275
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JCAE NOTIFICATION RECOMMENDED: ☐ YES ☐ NO

NRC FORM 232 (11-75)

EXECUTIVE DIRECTOR FOR OPERATIONS

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FROM:	ACTION CONTROL	DATES	CONTROL NO.
James A. Rack Niles, Ill.	COMPL. DEADLINE	5/12/76	00280
	ACKNOWLEDGMENT		DATE OF DOCUMENT
	INTERIM REPLY		3/30/76
TO:			PREPARE FOR SIGNATURE OF:
Chairman Anders	FINAL REPLY		☐ CHAIRMAN ☐ EXECUTIVE DIRECTOR
	FILE LOCATION		OTHER: Shapar

DESCRIPTION ☐ LETTER ☐ MEMO ☐ REPORT ☐ OTHER

Urges delay in granting an operating license for Diablo Canyon until actions are taken to strengthen the building against potential damage from earthquakes

SPECIAL INSTRUCTIONS OR REMARKS

Encl

EDO 76-1650

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JCAE NOTIFICATION RECOMMENDED: ☐ YES ☐ NO

NRC FORM 232
(11-75)

EXECUTIVE DIRECTOR FOR OPERATIONS

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PRINCIPAL CORRESPONDENCE CONTROL

No. 76- 1650 Logging Date 4/30/76
28

NRC SECRETARIAT

TO:
- ☐ Commissioner _____ Date 3/30
- ☒ Exec. Dir./Oper.
- ☐ Cong. Liaison
- ~~☒~~ Public Affairs
- ☒ Attn. ELD
- ☐ Gen. Counsel
- ☐ Solicitor
- ☐ Secretary

Incoming: James A. Mack, 7359 Breen Street,
From: Niless, Illinois 60648

To: Chairman Anders Date 3/30/76(pom4/23)

Subject: Asking for the delay in granting an operating license to the Diablo Canyon plant until actions are taken to strengthen the foundation against potential damage from earthquakes.

- ☐ Prepare reply for signature of:
  - ☐ Chairman
  - ☐ Commissioner _____
  - ☐ EDO, GC, CL, SOL, PA, SECY
  - ☐ Signature block omitted
  - ☐ _____
  - ☐ Return original of incoming with response

- ☒ For direct reply* SUSPENSE: May 12
- ☐ For appropriate action
- ☐ For information
- ☐ For recommendation

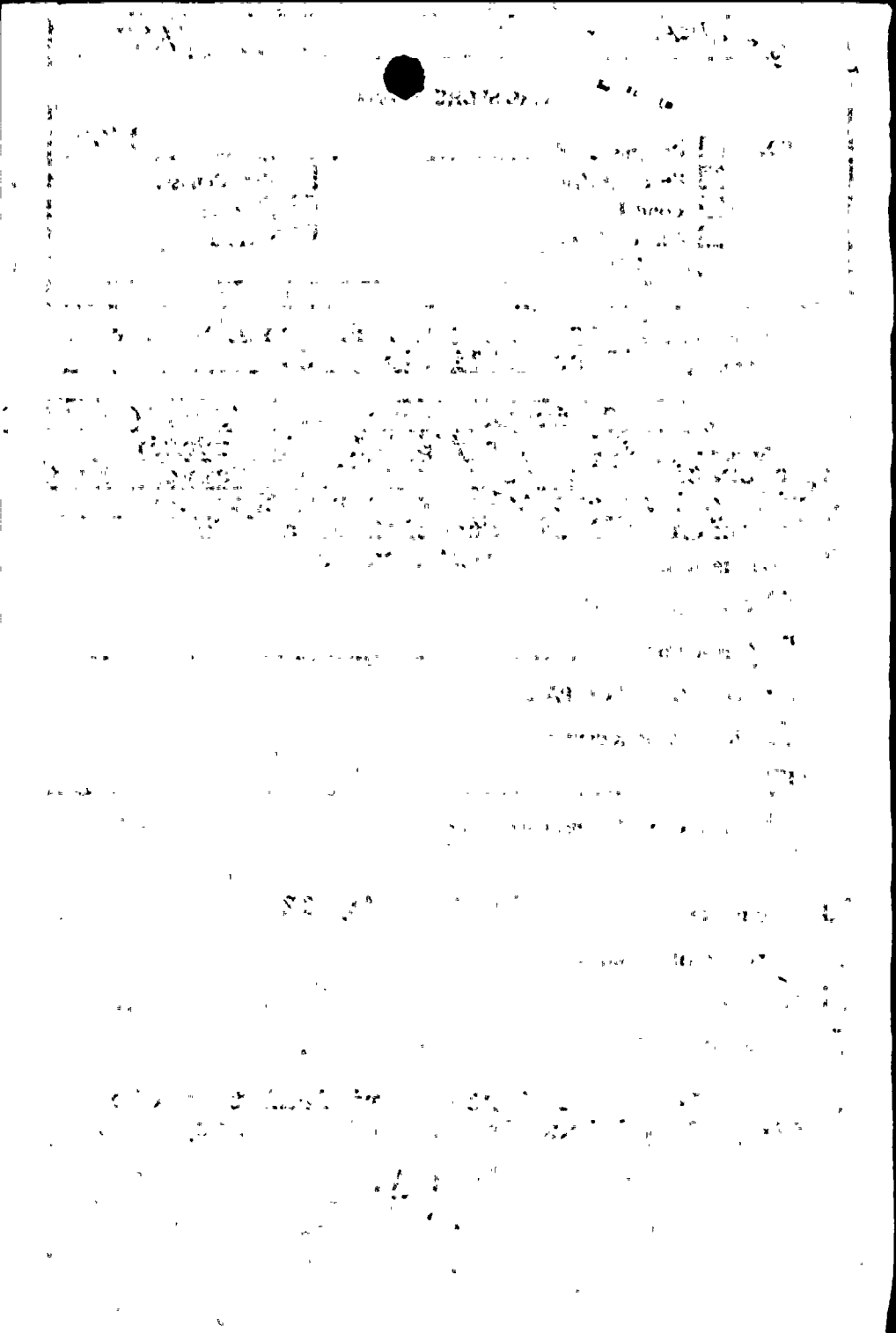
Rec'd Off. Dir.
Date 4/28/76
Time 4:10

Remarks: Logged Ex Parte. Original to Docket File. Cy of incoming to OGC, PE, Secy, PA.

For the Commission: [signature]

*Send three (3) copies of reply to Secy Mail Facility

NRC-62 ACTION SLIP



7359 Breen Street
March 30, 1976
Niles, Illinois 60648

William A. Anders, Chairman
Nuclear Regulatory Commission
Washington, D.C. 20515

Dear Mr. Anders:

It was not until a recent article in Time magazine that I became aware that of all the disasters that could be caused by a severe earthquake, none would be as horrible as the destruction of a nuclear power plant. The ruptured plant would release radioactive particles into the air. As a result, a colorless, odorless cloud would form and contaminate everything in its immediate area, poisoning the land, killing hundreds of people, and causing cancer to the survivors.

I understand that your agency in the past has enforced strict regulations to avoid such a catastrophe. All atomic power plants located within an earthquake zone must be constructed to withstand the greatest shaking ever recorded in that particular area.

In 1971, geologists from Shell Oil Company found an underwater fault that runs only 2½ miles west of the nearly completed Diablo Canyon power plant on the California coast. The only faults that were thought to be in the area prior to construction of the plant were the San Andreas fault, 45 miles inland, and the Rinconada fault, some 20 miles away. So the engineers designed that plant to survive a quake that would register at 6.75 on the Richter scale. The Hosgri fault that was recently discovered is believed to be the cause of the 1927 earthquake that was estimated to be 7.25 on the Richter scale. Following the guidelines set up by the NRC, the Diablo Canyon Plant is not designed with a sufficient margin of safety that would survive a serious jolt in this area.

As chairman you should see that the NRA delays granting an operation license to the Diablo plant until the appropriate actions are taken to strengthen the building further. There must be no compromises made when it comes to environmental safety, even if the result means higher electricity rates to consumers. Your agency should continue to promote nuclear power plants that are both economical and safe. If these two factors cannot be maintained at

at the same time, this type of energy should be discontinued. Appropriate action in this specific instance would reassure myself and other citizens that the NRA is a responsible agent of the peoples interest

Sincerly yours,

James A. Mack

James A. Mack