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04/18/78  
50-275/323

REC: STOLZ J F  
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DOC DATE: 04/11/78  
DATE RCVD: 04/17/78

DOCTYPE: LETTER NOTARIZED: NO  
SUBJECT:

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RESPONSE TO NRC INFORMAL REQUEST... FORWARDING INFO CONCERNING AN OPERATING  
BASIS EARTHQUAKE FOR SUBJECT FACILITY.

PLANT NAME: DIABLO CANYON - UNIT 1  
DIABLO CANYON - UNIT 2

REVIEWER INITIAL: XJM  
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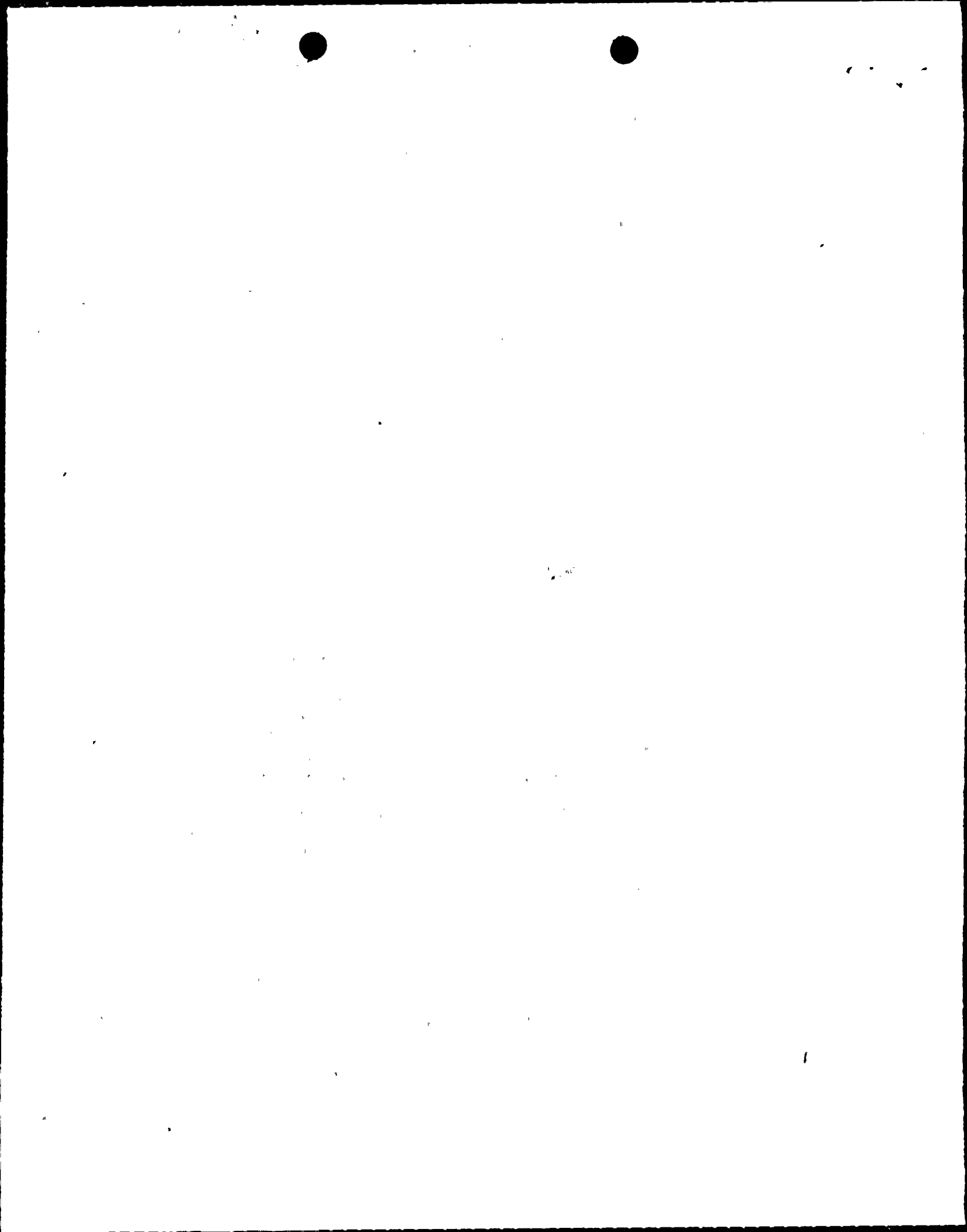
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I & E\*\*W/2 ENCL OELD\*\*LTR ONLY  
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ACRS CAT A\*\*W/16 ENCL

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PACIFIC GAS AND ELECTRIC COMPANY

PG&E + 77 BEALE STREET, 31ST FLOOR • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211

JOHN C. MORRISSEY  
VICE PRESIDENT AND GENERAL COUNSEL

April 11, 1978

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ARTHUR L. HILLMAN, JR.  
ROBERT OHLBACH  
CHARLES W. THISELL  
ASSISTANT GENERAL COUNSEL

Mr. John F. Stolz, Chief  
Light Water Reactors Branch No. 1  
Division of Project Management  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Re: Docket No. 50-275-OL  
Docket No. 50-323-OL  
Diablo Canyon Units 1 & 2

Dear Mr. Stolz:

The attached information responds to an informal request by the Regulatory Staff for information concerning an Operating Basis Earthquake for the Diablo Canyon Site.

Kindly acknowledge receipt of the above material on the enclosed copy of this letter and return it to me in the enclosed addressed envelope.

Very truly yours,

*Philip A. Crane*

Attachment (40 copies)

CC w/attachment: Service List

1978 APR 17 AM 10 55  
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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document provides a detailed overview of the accounting process, including the identification of transactions, their classification, and the recording of entries in the general ledger.

3. The third part of the document focuses on the preparation of financial statements, such as the balance sheet, income statement, and cash flow statement. It highlights the importance of adhering to established accounting standards and principles.

4. The fourth part of the document discusses the role of internal controls in preventing errors and fraud. It outlines key control measures, such as segregation of duties, authorization requirements, and regular reconciliations.

5. The fifth part of the document addresses the importance of staying up-to-date with changes in accounting regulations and standards. It emphasizes the need for continuous professional development and education.

Operating Basis Earthquake  
for Diablo Canyon, Units 1 & 2

The seismic design basis for Diablo Canyon, Units 1 & 2, was established in connection with proceedings leading to the issuance of construction permits for the units. The seismic design basis included consideration of a Design Earthquake (DE) having a maximum vibratory ground acceleration of 0.2g and a Double Design Earthquake (DDE) having a maximum vibratory ground acceleration of 0.4g. The Design Earthquake and Double Design Earthquake are equivalent to the Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE) as currently defined in Appendix A to 10 CFR 100.

Following the identification of the offshore zone of geologic faulting generally referred to as the "Hosgri Fault," the USNRC Regulatory Staff required that PG&E consider a postulated earthquake on the Hosgri fault in addition to those earthquakes considered in the seismic design basis. PG&E was required to evaluate the plant's capability to withstand such an earthquake using an effective zero period horizontal ground acceleration of 0.75g for the development of response spectra. This evaluation has been conducted using procedures and criteria analogous to those appropriate for a Safe Shutdown Earthquake. The evaluation is essentially complete and is under review by the USNRC Regulatory Staff. The evaluation shows that the plant, with some modifications which are now in progress, meets the established acceptance criteria.

A question has now arisen concerning the justification for the use of the Design Earthquake as the Operating Basis Earthquake for the plant, given the requirement that the plant be evaluated for the postulated earthquake on the Hosgri Fault. This concern appears to be rooted in the wording of Appendix A to 10 CFR 100, Section V(a)(2), which states that "...The maximum vibratory ground acceleration of the Operating Basis Earthquake shall be at least one half the maximum vibratory ground acceleration of the Safe Shutdown Earthquake."

It is PG&E's position that the appropriate Safe Shutdown Earthquake for the plant, as currently defined in Appendix A to 10 CFR 100, is the Double Design Earthquake included in the plant's seismic design basis. Since the maximum vibratory ground motion of the Design Earthquake is one-half of the maximum vibratory ground motion of the Double Design Earthquake, the Design Earthquake meets the requirements for an Operating Basis Earthquake contained in the above cited section of Appendix A to 10 CFR 100.

Furthermore, the USNRC Regulatory Staff, in licensing actions for a number of plants, has clearly established the Staff position that the intent of the Regulations concerning requirements for the severity of the Operating Basis Earthquake is adequately described in Section III(d) of 10 CFR 100, Appendix A, which defines the Operating Basis Earthquake as "...that earthquake which, considering the regional and local geology and seismology and specific characteristics of local subsurface material, could reasonably be expected to affect the plant site during the operating life of the plant...". The Regulatory Staff has recognized that the wording of Section V(a)(2) of 10 CFR 100, Appendix A, is not necessarily consistent with the intent of the Regulations and has accepted for a number of plants (e.g. Byron-Braidwood, Clinton, Koshkonong, Marble Hill and Phipps Bend)



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an Operating Basis Earthquake having a maximum vibratory ground acceleration less than one-half of the Safe Shutdown Earthquake. The basis for establishing the Operating Basis Earthquake for these plants was a probabilistic analysis estimating the exceedance probability and return period. In licensing actions for at least one of these plants, the Regulatory Staff stated its acceptance criteria for an Operating Basis Earthquake. These criteria are given below, as reported in the transcript of the 205th General Meeting of the Advisory Committee on Reactor Safeguards, Thursday, 5 May 1977, Page 67, Lines 16 through 25:

"The Operating basis earthquake as defined by Appendix A is an earthquake which could reasonably be expected to affect the plant site during the operating life of the plant. Based on this definition, the Staff considers that an earthquake that exhibits an exceedance probability of no more than 30 percent and a return period of approximately 110 years to represent an event which could reasonably be expected to affect the plant site and produces a conservative acceleration level for the operating basis earthquake."

Several analyses have been made by PG&E and its consultants which estimate exceedance probabilities and average return periods for various values of peak instrumental and peak effective acceleration at the Diablo Canyon site. The results of these analyses have been submitted by PG&E in support of its operating license application for Diablo Canyon and are included as reports D-LL 11, D-LL 28, D-LL 41 and D-LL 45 in Appendix D to PG&E's "Seismic Evaluation for Postulated 7.5M Hosgri Earthquake." The analyses consider the factors of regional and local geology and specific characteristics of local subsurface material as required by Section III(d) of Appendix A to 10 CFR 100. Since the analyses employed a number of variations in methodology, the results show a range of exceedance probabilities and average return periods for a given site acceleration. For a peak instrumental acceleration (maximum vibratory ground acceleration) at the site of 0.20g, the lowest average return period computed by any of the methods used in the analyses is 275 years. The corresponding exceedance probability for a 40 year plant lifetime is approximately 14.5 percent. PG&E believes that 275 years is a very conservative estimate of the average return period associated with the Design Earthquake for Diablo Canyon. Since this average return period is more than twice the 110 year period specified in the Regulatory Staff's stated acceptance criteria, it is clear that the Design Earthquake should be acceptable to the Regulatory Staff as the Operating Basis Earthquake for the Diablo Canyon Units.

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