NOV 10 1977

DOCKET NOS: 50-275 and 50-323

APPLICANT: Pacific Gas and Electric Company (PG&E)

FACILITY: Diablo Canyon Nuclear Power Station, Units 1 and 2 (Diablo Canyon)

SUMMARY OF MEETING HELD ON NOVEMBER 3, 1977 TO DISCUSS STATUS OF OPERATING LICENSE REVIEW

We met with PG&E on November 3, 1977 in Bethesda, Maryland to discuss the status of our review of the interim operating license request and the full-term operating license application. A list of attendees is provided in Enclosure No. 1.

Background

In accordance with the construction permits, the plant had been originally designed to withstand an earthquake with a reference horizontal ground acceleration of 0.4g. Construction of Unit 1 had been substantially complete since 1976.

As requested by the NRC staff in April 1976, PG&E was performing a re-analysis to determine what modifications might be necessary in order to withstand an earthquake with a reference horizontal ground acceleration of 0.75g. The results from a substantial portion of the reanalysis had been submitted in Amendment 50 to the Final Safety Analysis Report (FSAR) in June 1975. PG&E was expected to submit the remainder of the results in the near future.

In addition, in August 1977, PG&E had requested an interim operating license to allow plant operation pending a decision on the normal or full-term operating license. The technical information submitted in support of the interim operating license had included:

1. Information concerning the need for an interim operating license (need for electric power).

2. Probabilistic analyses of the likelihood of major earthquakes in the vicinity of the plant and the likelihood of the plant withstanding such earthquakes without unacceptable releases of radioactivity.

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3. Information concerning the relative risk involved (risk associated with the interim operating period vs risk associated with a full-term operating period after plant modification).

4. A commitment to complete the reanalysis and perform any modifications determined to be necessary.

5. A commitment to perform prior to initial operation, any modifications that would involve substantial radiation doses to workers if they were deferred until after the plant had been operated.

Need for Power

We had received a report from the California Energy Resources Conservation and Development Commission (ERCDC) indicating that it did not appear there would be a drastic shortage of electrical generating capacity in the State of California in the Summer of 1978, even assuming another dry year. We indicated to PG&E that our tentative preliminary assessment was in substantial agreement with that of ERCDC.

PG&E disagreed strongly with this conclusion and provided a letter responding to the ERCDC report. We indicated that we would review PG&E's response.

PG&E indicated that the disagreement seemed to be about the conclusions drawn rather than the basic data. They indicated that Federal Power Commission (FPC) data from the past 10 years suggests that any time the generating capacity margins are less than 15 percent on a system, the system may be subject to reliability problems. We indicated that we had asked FPC for an opinion as well as ERCDC.

Interim License Review

We told PG&E that we would need additional information in order to complete our evaluation of the interim license request. The information we needed fell into four categories:

1. Questions on the earthquake probability studies (Enclosure 2).

2. Questions on the Relative risk assessment (Enclosure 3).

3. Questions on long term cooling during the interim operating period (Enclosure 4).

4. We had decided that, in order to include a definitive finding on the practicality of future modifications and the adequacy of the existing seismic design, it would be necessary to resolve certain

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ENCLOSURE NO. 1

LIST OF ATTENDEES

DIABLO CANYON MEETING

NOVEMBER 3, 1977

NRC Staff

D. Allison
J. Stolz
J. Tourtellotte
F. Schroeder
L. D. Davis
W. Gammill
R. Mattson
H. Denton
E. Case
B. J. Youngblood
R. C. DeYoung
J. Murphy
J. C. Stepp
J. Knight
D. Vassallo

PG&E

H. Gormly
W. Lenfesty
R. Bettinger
J. Hoch
M. Furbush
B. Shakelford
P. Crane
E. Kaprielian

PG&E Consultant

A. Cornell

Intervenor's Consultant & Attorney

B. Rushforth
R. Hubbard
D. Fleischaker

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| SURNAME➤ | | | | | | |
| DATE➤ | | | | | | |

outstanding generic questions prior to issuance of a Safety Evaluation Report (SER) on the interim license request (rather than prior to licensing). These generic questions involved the effects of loads due to postulated pipe breaks at the reactor vessel nozzle in combination with an assumed concurrent earthquake. PG&E had nearly completed the analysis of these effects and was planning to report the initial results at a meeting on November 10, 1977.

We also discussed the prospective schedule for completing the interim license review (Enclosure 5). It currently appeared that item (4) above would control the schedule. However, depending upon assumptions regarding submittal dates and review time, item (1) above might be controlling. In any event, it appeared that the earliest a SER could be issued would be early January 1978 (two months past the existing schedule). As indicated on Enclosure 5, it could be later depending upon submittal dates and review times.

Full Term License Review

We also discussed the prospective schedule for the full-term license review (Enclosure 6). Again, the schedule depended upon assumptions regarding submittal dates and review times. PG&E was planning to submit the results of the remaining reanalysis about December 1, 1977 so the soonest possible date to issue a SER on this subject would be April 1, 1978. It could be later.

PG&E stated that the reanalysis was substantially completed, design of modifications was proceeding on an expedited schedule, and that the plant modifications should be completed by July 1978.

General Review Status

We said that the schedules did not seem to indicate that a decision could be reached on an interim license very much sooner than on a full term license. In addition, if the two approaches were pursued in tandem both would be delayed somewhat in relation to the prospective schedules in Enclosure 5 and Enclosure 6 due to interference and other factors.

We indicated that, in these circumstances, a difficult decision faced PG&E on whether or not to continue vigorous prosecution of the interim license request.

It was also noted that the Advisory Committee on Reactor Safeguards had not yet provided a recommendation on the acceptability of the design basis for the reanalysis (0.75g). The ACRS Subcommittee had recommended probabilistic studies similar to the studies offered in support of the interim license request. Accordingly, even if the interim license request were not prosecuted vigorously, the work that had been done might be an important element in the Committee's recommendation on the adequacy of the design basis.

NOV 10 1977

It did not appear, at that time, that the resolution of other (non-seismic) issues would control either schedule. However, significant concern was expressed about this conclusion. We indicated that, in the near future, we would provide a complete punch list of all items to be resolved.

Original Signed by
Dennis P. Allison

D. Allison, Project Manager
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:
As Stated

| | | | | | | |
|---|---|---|---|---|---|---|
| OFFICE➤ | DPM:LWR #1 | DPM:LWR #1 | | | | |
| SURNAME➤ | DPAllison:cz | JFStolz | | | | |
| DATE➤ | 11/9/77 | 11/10/77 | | | | |

MEETING SUMMARY

Docket File
NRC PDR
Local PDR
TIC
NRR Reading
LWR-#1 File
E. Case
R. Boyd
R. DeYoung
D. Vassallo
J. Stolz
K. Kniel
O. Parr
S. Varga
L. Crocker
D. Crutchfield
F. Williams
R. Mattson
H. Denton
D. Muller
Project Manager:
Attorney, ELD
E. Hylton
IE (3)
ACRS (16)
L. Dreher
NRC Participants:
S. Rubenstein
T. Hirons
J. Wetmore
L. Shao
H. Levin

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 10 1977

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D. Allison

D. Allison, Project Manager
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:
As Stated

cc: Philip A. Crane, Jr., Esq.
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Janice E. Kerr, Esq.
California Public Utilities Commission
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San Francisco, California 94102

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Santa Barbara, California 93105

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San Luis Obispo, California 93401

Ms. Sandra A. Silver
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Mr. Gordon A. Silver
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Santa Ana, California 92701

ENCLOSURE NO. 1

LIST OF ATTENDEES

DIABLO CANYON MEETING

NOVEMBER 3, 1977

NRC Staff

D. Allison
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J. Murphy
J. C. Stepp
J. Knight
D. Vassallo

PG&E

H. Gormly
W. Lenfesty
R. Bettinger
J. Hoch
M. Furbush
B. Shakelford
P. Crane
E. Kaprielian

PG&E Consultant

A. Cornell

Intervenor's Consultant & Attorney

B. Rushforth
R. Hubbard
D. Fleischaker

ENCLOSURE 2

Request for Additional Information:
Diablo Canyon

While we find the assumptions and arguments used in report D-LL41 to be reasonable, a test of the results using more usual methodologies for computing earthquake probabilities has not been made. To accomplish this, the applicant should compute the probability of ground motion at the site using the usual method. The seismicity sample should be drawn from the San Andreas fault system sector of the Pacific/North America plate boundary. The occurrence of the predicted event in space should be determined by the relative movements on various faults within the San Andreas system.

The attenuation curves used in D-LL41 give values that are low relative to those obtained using the competing curves of Trifunac and Brady. This difference should be explained.

ENCLOSURE 3

STRUCTURAL ENGINEERING BRANCH
Division of Systems Safety

REQUEST FOR ADDITIONAL INFORMATION REGARDING THE REPORT ENTITLED "ANALYSIS OF RELATIVE RISK ASSOCIATED WITH OPERATION OF THE DIABLO CANYON NUCLEAR POWER PLANT UNTIL FOR AN INTERIM LICENSING PERIOD" BY W. K. BRUNOT

1. The major conclusion of this study indicated on page 5 is that "for all cases analyzed, the ratio of risk during the interim license to the risk during the full term license is less than unity." Elaborate on this conclusion and whether it is equally valid for plant damage probability curves other than those assumed in Fig. II of the report. Specifically, discuss various combinations of seismicity and failure probability curves that will produce a risk ratio of greater than one, and provide the bases, if any, for concluding that such cases are not significant. For example, discuss the combination of the Case C (for .4g nominal design) with Case A (for .75g nominal design). Since plant failure is treated conservatively for both 0.4g and 0.75g designs, the risk computed for each case is likely the upper bound. However, taking the ratio of two upper bounds reveals little about the ratio of the true risks. Discuss possible means to alleviate this concern including specific proposals for conducting an adequate number of case-bounding studies with unconservative assumptions for both the plant failure and seismicity hazard probability curves.

2. Discuss the adequacy of using a simple one-parameter (acceleration) to define the seismic hazard and the failure probability in the evaluation of relative risks, considering these are a function of many parameters (e.g., ground acceleration, frequency content of ground motion, damping, variability of seismic capacity of various elements, etc.). Also, address simplistic means, if any, to account for these parameters in the relative risk analysis model.

## ENCLOSURE 4

### Diablo Canyon Long-Term Cooling

The applicant must submit procedures and identify equipment that would be available to provide an extended water source (such as the ultimate heat sink) that would be available following a 0.4G earthquake before the normal supply would be exhausted. The extended water source and its availability to the auxiliary feedwater pumps must meet single active failure requirements and be operable without offsite power.

INTERIM LICENSE REVIEW
ESTIMATED SCHEDULE

ENCLOSURE 5

TIMES IN MONTHS FOLLOWING COMPLETED SUBMITTALS

| | OPT. | REAL. | PESS. |
|---|---|---|---|
| PG&E SUBMIT COMPLETED WORK ON ASYMMETRIC LOADS | X | Y | Z |
| STAFF PUBLISH SER | $1\frac{1}{2}$ | $2\frac{1}{2}$ | $3\frac{1}{2}$ |
| ACRS LETTER | 3 | 4 | 6 |
| START HEARING | $4\frac{1}{2}$ | 6 | 8 |
| STOP HEARING | $5\frac{1}{2}$ | 7 | $9\frac{1}{2}$ |
| DECISION | 7 | $9\frac{1}{2}$ | 12 |

NOTES:

(1) ESTIMATED TIMES TO COMPLETE REVIEW AND PUBLISH SER FOLLOWING COMPLETED SUBMITTALS ON EARTHQUAKE PROBABILITIES, RELATIVE RISK AND LONG TERM COOLING ARE:

X + 3/4
Y + 1 3/4
Z + 2 3/4

IT DOES NOT CURRENTLY APPEAR THAT THESE TIMES WOULD CONTROL THE SCHEDULE. HOWEVER, THEY COULD, [illegible] SUBMITTAL DATES ARE MUCH LATER THAN CURRENTLY ASSUMED.

(2) NUMEROUS "OTHER" ISSUES MUST BE RESOLVED PRIOR TO HEARINGS. IT DOES NOT CURRENTLY APPEAR THAT THESE ITEMS WOULD CONTROL THE SCHEDULE.

ENCLOSURE 6

# FULL TERM LICENSE REVIEW ESTIMATED SCHEDULE

TIMES IN MONTHS FOLLOWING COMPLETED SUBMITTALS

| | OPT | REAL | PESS |
|---|---|---|---|
| PG&E SUBMIT COMPLETED WORK ON REANALYSIS INCLUDING MODIFICATION INFORMATION | X | Y | Z |
| STAFF PUBLISH SER | 4 | 5 | 6 |
| ACRS LETTER | 5½ | 6½ | 8½ |
| START HEARINGS | 7 | 8½ | 10½ |
| STOP HEARINGS | 8 | 9½ | 12½ |
| BOARD DECISION | 9½ | 12½ | 14½ |
| MODIFICATIONS COMPLETED | ? | ? | ? |

NOTES:

(1) IT DOES NOT CURRENTLY APPEAR THAT ASYMMETRIC LOADS WOULD CONTROL THIS SCHEDULE. HOWEVER, THEY COULD, DEPENDING ON SUBMITTAL DATES, BY SUCH CONTINUITIES AS PESSIMISTIC ASYMMETRIC LOAD SCHEDULE WITH OPTIMISTIC REANALYSIS SCHEDULE.

(2) NUMEROUS "OTHER" ISSUES MUST BE RESOLVED PRIOR TO HEARINGS. IT DOES NOT CURRENTLY APPEAR THAT THESE ITEMS WOULD CONTROL THE SCHEDULE.