SEP 27 1974

DOCKET NOS: 50-275 AND 50-323

APPLICANT: PACIFIC GAS AND ELECTRIC COMPANY (PG&E)

FACILITY: DIABLO CANYON, UNITS 1 AND 2

SUMMARY OF ACRS SUBCOMMITTEE MEETING HELD ON SEPTEMBER 12, 1974

An ACRS Subcommittee Meeting regarding the Diablo Canyon Nuclear Power Station was held in Washington, D. C. on September 12, 1974. The purpose of the meeting was to provide the ACRS and their consultants with an early review of the Diablo Canyon operating license application, with emphases on geology and seismology and ECCS - Appendix K evaluation. A complete list of attendees is given in Enclosure No. 1.

After opening remarks by the Subcommittee Chairman and a summary of the status of the Regulatory staff review, PG&E and Westinghouse presented a summary of the ECCS - Appendix K calculations for the Diablo Canyon Units. These calculations have been documented in Amendment 15 of the FSAR (submitted on August 5, 1974). The applicant first reviewed the evolution of the ECCS development from the time of the construction permit review on Unit 1 (1967). At that time the ACRS recommended that further work be done on improved passive failure protection, evaluation of blowdown forces on the reactor internals, and verification regarding the ability of the ECCS to perform in preventing fuel clad melting in the presence of failed fuel. PG&E also reviewed some of the considerations which led to their decision to change the fuel design from the then existing 15 x 15 configuration to the present 17 x 17 design.

Westinghouse then presented the results of the Appendix K analysis of the Diablo Canyon reactors. For comparison purposes, results of some previous analyses, based on the interim acceptance criteria (IAC), were presented for both 15 x 15 and 17 x 17 fuel designs. The Appendix K calculations utilized a total peaking factor of 2.32, and resulted in lower peak power and lower clad temperatures than those calculations performed using the IAC. Several reactor parameters, e.g., peak clad temperature, pressure, core flow, were presented as a function of break size, discharge coefficient and time following the accident. The limiting break was defined as the double-ended, cold-leg guillotine, with a discharge coefficient of 0.6. After numerous questions from the Subcommittee members, the staff summarized the review schedule for Appendix K calculations. The generic review of the Westinghouse model with regard

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to Appendix K calculations will be completed by October 10, 1974, and a report will be issued. A supplement to the Diablo Canyon safety evaluation report covering the specific Diablo Canyon calculations will be issued around the end of October. The staff indicated that the ACRS Subcommittee on ECCS plans to meet on September 28, 1974, and that a complete status report of our review of the Westinghouse model will be given at that time.

As a final issue with regard to the Westinghouse 17 x 17 fuel design, the staff commented on each of the remaining outstanding items in the generic review of the 17 x 17 fuel design. These outstanding items were documented in a letter to R. Salvatori of Westinghouse dated July 26, 1974, and include the following: 1. Fuel performance surveillance program and schedule for that program; 2. Details of the technical specification procedures for maintaining the peaking factor within limits, including the alarms to be provided; 3. Design value of the criticality factor for the core during refueling and for the fuel storage pool; 4. A dynamic analysis of the reactor vessel internals; 5. The results of the planned DNB tests using non-uniform axial heat flux which must be used to verify the 17 x 17 DNB correlation and the DNBR that corresponds to the 95/95 criterion; and 6. The effects of bowing on the 17 x 17 fuel. The staff responded individually to each of these items, and indicated that each one would have to be resolved on the Diablo Canyon docket.

The majority of the remaining portion of the meeting was devoted to a detailed presentation by PG&E's consultants on the geology and seismology of the central California Coastal region, including both onshore and offshore areas. The presentation was handled chiefly by D. H. Hamilton of Earth Sciences Associates. Hamilton first discussed the regional geologic setting within which the Diablo Canyon site is located. In this discussion he utilized a USGS geologic map which had been supplemented with some additional lines indicating the location of major offshore faults. The presentation included the details of all known faults in the area, and a description of the age of these faults, their composition, etc. The ACRS and their consultants asked numerous questions regarding the material that was presented.

Dr. Stewart Smith, PG&E's seismic consultant, then made a brief presentation on the location of various earthquake epicenters in the area. Dr. Smith has been involved with the seismic analysis of the area for almost 10 years. Smith indicated that the earthquake epicenter maps available in 1966 showed only a few scattered epicenters in the range magnitude of

of 4 to 4 1/2 within about 20 miles of the site. As a result of this, PG&E was not really able to rely on the seismic history of the area because the time sample was short and the seismographic coverage was poor because the area lies midway between the Berkeley and Cal Tech seismic networks. PG&E therefore chose the approach of looking more at the geologic evidence for faulting and associating earthquakes with faults. In addition, the concept of an unassociated earthquake (not associated with a known fault) close to the site was introduced. This procedure reflected the basic uncertainties in where earthquakes would take place in the future, and at the same time attempted to take into account what might occur in the way of aftershocks from a great earthquake on the San Andreas Fault. Dr. Smith's presentation also included a description of the methods used in arriving at the design acceleration values for the plant structures. As before, the ACRS and their consultants asked a number of questions regarding the presentation.

The formal agenda for the meeting was concluded with brief presentations by PG&E on their tsunamic analysis for waves caused by near-shore generators, and a description of the tornado capability analysis performed for safety-related structures and components.

As a final point on geology and seismology, PG&E stated that their final report would be submitted to the staff sometime in early October of 1974. The ACRS indicated that they would require another Full Subcommittee meeting on geology and seismology and that this meeting should be held after the staff's (and USGS) evaluation of these areas has been completed.

Thomas J. Hirons

Thomas J. Hirons
Light Water Reactors
Project Branch 1-3
Directorate of Licensing

Enclosure:
Attendance List

cc: Mr. P. A. Crane
Mr. W. J. Lindblad
Andrew J. Skaff, Esq.
Ms. Elizabeth E. Apfelberg
Ms. Sandra A. Silver
Mr. John Forster
Mr. Lonnie Valentine
Mr. Frederick Eissler
~~Mr. William P. Cornwell~~
Mr. J. W. Dorrycott

OFFICE ➤		L:LWR 1-3			
SURNAME ➤		THirons:pga			
DATE ➤		9/27/74			

ENCLOSURE NO. 1

ATTENDANCE LIST

ACRS

Dr. Monson
Dr. Isbin

ACRS CONSULTANTS

Dr. S. Philbrick
Dr. M. Trifunac
Dr. G. Thompson

ACRS STAFF

J. Conran

PACIFIC GAS AND ELECTRIC COMPANY

R. Bettinger
P. A. Crane
V. J. Ghio
H. J. Gormley
J. B. Hoch
W. J. Lindblad
E. Wollak

PG&E CONSULTANTS

D. H. Hamilton (Earth Sciences Associates)
Dr. S. W. Smith (University of Washington)

WESTINGHOUSE

A. J. Abels
P. Blau
J. W. Dorrycott
S. Kopelic
D. Peacock
T. Zordan

USGS

J. Devine
F. Hauser
F. McKeown

AEC - STAFF

D. P. Allison
J. M. Cutchin
M. S. Dunenfeld
G. Fess
W. P. Gammill
T. J. Hirons
D. M. Houston
R. B. McMullen
T. M. Novak
O. D. Parr
J. C. Stepp
P. Wood

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J. Knight
L. Shao
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W. Gammill
R. Ballard
P. Fine
T. Novak
M. Spangler
EP Project Manager - R. Cushman
OGC
RO (3)
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RWKlecker

Edson G. Case, Acting Director of Licensing
THRU: A. Giambusso, Deputy Director for Reactor Projects, L

STATUS OF THE GEOLOGY AND SEISMOLOGY PORTION OF THE DIABLO CANYON OPERATING LICENSE SAFETY REVIEW

The staff last met with PG&E on this item on July 5, 1974. The summary of this meeting is attached as Enclosure No. 1. The primary purpose of this meeting was to review the progress of the offshore geological investigations which had recently been initiated by the applicant. At that time, PG&E stated that their final report on offshore faults would be submitted to the staff by September 1, 1974. The staff indicated that 30-45 days would be required for staff and USGS review of this report, and that, assuming favorable resolution of this item, a supplement to the safety evaluation on geology and seismology could probably be issued around mid-October of 1974. This date would conform reasonably well with the scheduled ACRS full committee meeting date of November 14-15, 1974.

In late August PG&E verbally informed the staff that their final report would be delayed about three weeks from the September 1 date. They indicated that the report would discuss all field work accomplished to date, would contain some new analysis of earthquake epicenters, and would mention the results of meetings with two oil companies regarding offshore geological data which are considered by these companies to be proprietary. The report will not contain the results of some additional (confirmatory) field work which PG&E is planning for September and October.

This three week slip will delay issuance of the SER supplement on this subject to approximately the first week in November, and makes the schedule extremely tight with regard to giving ACRS and their consultants appropriate time to review the report in time for the mid-November full committee meeting. An early Diablo Canyon ACRS subcommittee meeting emphasizing geology and seismology is scheduled for September 12, 1974. At this meeting PG&E will discuss all work performed to date, although their final written report will not be available at this time. This meeting will provide the ACRS and their consultants with an initial presentation on the Diablo Canyon geology and seismology.

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With regard to evaluation of the seismic potential of the offshore faults in the vicinity of Diablo Canyon, the staff and USGS will need to review PG&E's report before a final determination can be made. The staff did conclude after the July 5, 1974 meeting that PG&E had undertaken a very comprehensive offshore field program. However, the feeling still prevails that it will be extremely difficult to establish the capability of these faults using conventional dating methods.

Original signed by
D. Vassallo for/
R. C. DeYoung, Assistant Director
for Light Water Reactors Group 1
Directorate of Licensing

Enclosure:
1. Meeting Summary
dtd July 11, 1974

OFFICE	L:LWR 1-3	L:LWR 1-3	L:AD/LWR	L:DD/LWR		
SURNAME	TJHirons:cls	for ODParr	RCDeYoung	AGiambusso		
DATE	9/6/74	9/6/74	9/6/74	9/6/74		

ENCLOSURE 1

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JUL 11 1974

DOCKET NOS: 50-275 and 50-323

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

FACILITY: Diablo Canyon Units 1 and 2

SUMMARY OF MEETING HELD ON JULY 5, 1974 REGARDING OFFSHORE FAULTS

A meeting betwen representatives of PG&E, their consultant (Earth Sciences Associates), and the AEC was held at the applicant's offices in San Francisco on July 5, 1974. A complete list of attendees is given in Enclosure No. 1. The primary purpose of the meeting was to review the progress of the offshore geological investigations which have been initiated recently by the applicant.

Earth Sciences Associates presented a summary of the Diablo Canyon Offshore Seismic Interpretation Program, and the Prospectus on Future Data Acquisition and Interpretation Programs. This summary is attached as Enclosure No. 2, and is divided into four parts:

1. Existing data,
2. State of interpretation,
3. Future data acquisitions,
4. Prospectus on future interpretations and final report.

In addition to the offshore work, representatives of Earth Sciences also discussed additional field work to be performed on land. This included explorations in the San Luis Range in the vicinity of the Miguelito Fault, work near San Simeon Point where tertiary faulting has been reported, and some examination of the transverse range structures near Point Sal. Finally, PG&E is currently conducting a review of aerial photographs that are available.

The subject of availability of oil company geological data was discussed at some length. PG&E indicated that they had contacted several companies and that arrangements could possibly be made to examine some of the data. However, the oil companies cannot make the data available publicly. In general, the data obtained by these companies gives only deep structure information, and provides lighter coverage than that obtained from some of the recent USGS work.

PG&E indicated that all field work, both on land and offshore, would hopefully be completed by the end of July, and that their final report would be submitted to the staff by September 1, 1974. Allowing appropriate time for staff and USGS review of this report, our safety evaluation of geology and seismology would probably be published around mid-October of 1974.

Thomas J. Hirons

Thomas J. Hirons, Project Manager
Light Water Reactors
Project Branch 1-3
Directorate of Licensing

Enclosures:
1. Attendance List
2. Summary of State of Diablo Canyon Offshore Seismic Interpretation and Prospectus on Future Data Acquisition and Interpretation Programs

cc: Pacific Gas and Electric Company
Mr. W. J. Lindblad
Andrew J. Skaff, Esq.
Ms. Elizabeth E. Apfelberg
Ms. Sandra A. Silver
Mr. John Forster
Mr. Lonnie Valentine
Mr. Gordon Silver
Mr. William P. Cornwell

ENCLOSURE NO. 1

ATTENDANCE LIST

Pacific Gas and Electric Company

R. Bettinger
V. J. Ghio
J. B. Hoch
F. F. Mautz*
J. C. Morrissey

Earth Sciences Associates
(PG&E Consultant)

D. H. Hamilton
R. Wellingham

AEC - Licensing

T. J. Hirons
R. B. McMullen
J. C. Stepp

*Denotes part time attendance

ENCLOSURE NO. 2

Summary of State of Diablo Offshore Seismic Interpretation
and Prospectus on Future Data Acquisition and Interpretation Programs

1. Existing data.
   a. USGS Kelez cruise sparker data covering area from Pt. Sal to Cape San Martin to an average distance of 10 miles offshore. Quality: good - poor; maximum penetration about 10,000 feet.
   b. USGS Bartlett data covering area from Point Sal to Cape San Martin. Tracks approach to within 3 miles of shore and extend approximately 15 miles off coast. Spacing between tracks is about 5 miles. Quality good to excellent; maximum penetration about 10,000 feet.
   c. BBN sparker data with high density coverage off Diablo Canyon site and northwest to Point Estero. Quality good; maximum penetration 3000 feet.
2. State of Interpretation.

A preliminary interpretation has been completed of the USGS Kelez cruise and all BBN data. This interpretation has concentrated upon structures existing in the Miocene and Pliocene strata in the offshore Santa Maria Basin. The interpretation has also emphasized determination of the nature of the contact between the Pliocene strata and the Mesozoic rocks which form the bedrock and basement complex bounding the east side of the Santa Maria Basin. A detailed examination also has been made of the junction of the WNW-trending structures of the San Luis range with the eastern border of the San Luis range.

3. Future Data Acquisitions
   a. BBN sparker; maximum penetration 3000 feet.
      1) BBN has been contracted to shoot 240 miles of sparker line between Cape San Martin and Point Lobos. The purpose of this data is to trace the northern extension of the offshore structures located by previous sparker surveys.
   b. Aquatronics sparker; maximum penetration about 4000 feet.
      1) Aquatronics has been retained to provide a more detailed assessment of the structural merger of the San Luis range structures and the structures

bounding the eastern edge of the Santa Maria Basin. They will also provide reconnaissance data to be util . . in tracing th. southern continuation of the offshore structures from Point Sal to Point Arguello.

c. Oil Company Data.

1) Plans are now in operation to obtain any available oil company data in the area of concern. These data will be useful in delineating the form of the basement sediment interface, but because of its mode of collection will not likely aid in interpreting the near surface (e.g., recent) geologic history of the region.

4. Prospectus on Future Interpretations and Final Report.

a. Work to date has delineated a major NW-trending zone of faulting immediately off the central California coastline. The available data have provided a picture of the trends and extent of major folds and faults in this zone. It has also delineated the major structural styles along the coast. Areas of particular interest where more interpretative work is necessary include: 1. The juncture of the trends of the San Luis range with the eastern edge of the Santa Maria Basin; 2. The nature of the sediment basement interface along the entire coastal area in question; and 3. The determination of the relationship of observed structures with the NW-trending faulting within and south of Monterey Bay and the EW-trending structures associated with the northwestern Transverse Ranges.

b. The final report is to have the following form.

1) A written report discussing the stratigraphy, structural style, and regional tectonic significance of the offshore fault systems of significance in evaluating earthquake hazards at the Diablo Canyon reactor site.

2) The written report will be accompanied by maps showing:

a) The position of surface geologic contacts and position of surface and subsurface faulting and folding.

b) The thickness of Pliocene sediments.

c) The configuration of the basement surface.

3) Illustrations will also be included to show examples of the data used in reaching the conclusions presented in the report.