

CERTIFIEDCERTIFIED COPY
DATE ISSUED:
April 7, 1988SUMMARY/MINUTES OF THE
ACRS SUBCOMMITTEE ON DIABLO CANYON
FEBRUARY 23-24, 1988
SAN FRANCISCO, CALIFORNIA

The ACRS Subcommittee on Diablo Canyon met at the Sheraton International in Burlingame, California (near the San Francisco airport) on February 23 and 24, 1988 to review the status of the Diablo Canyon Long Term Seismic Program (LTSP).

Notice of the meeting was published in the Federal Register on February 5, 1988 (Attachment A). The schedule of items covered in the meeting is in Attachment B. A list of handouts kept with the office copy of the minutes is included in Attachment C. There were no written or oral statements received or presented from members of the public at the meeting. E. G. Igne was cognizant ACRS members for the meeting.

Principal Attendees

C. P. Siess, Chairman
D. Moeller, ACRS Member
W. Kerr, ACRS Member
J. Ebersole, ACRS Member
R. Scavuzzo, ACRS Consultant
P. Davis, ACRS Consultant
B. Page, ACRS Consultant
J. Maxwell, ACRS Consultant
M. Trifunac, ACRS Consultant

NRC Staff

N. Chokshi
G. Bagchi
H. Rood
R. Rothman

PG&E

D. Brand
L. Cluff
W. Savage
Yi-Ben Tsai
S. Shattacharya
R. Domer
D. Ovadia
B. Iew
G. Sarkisian
J. Malkin
J. Hoch
D. Hamilton
B. Norton
R. Locke
J. Blakley
M. Treslen
B. Sarkar

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PDR

B. Smith

Others

L. Mualchin, Calif. Div. of Mines & Geology
W. White, Bechtel
K. Coppersmith, Geomatrix
W. Lettis, Geomatrix

Highlights

1. N. Chokshi, RES, presented an overview on the Diablo Canyon Long Term Seismic Program (LTSP), describing background and a summary of the licensing conditions. He stated that under the direction of the Commissioners and the ACRS, the NRC Staff was urged to have a strong review and independent parallel program. Technical assistance in the various areas of work are listed as follows:

- o Geology, tectonics and geophysics - USGS and UNR,
- o Seismology and ground motion - USGS and LLNL panel,
- o Soil structure interaction and Fragility - BNL panel
- o Probabilistic Risk Assessment - BNL

Presently about 29 workshops, meetings, field trips and audits have been held on the LTSP.

Some members of the subcommittee stated that an important objective of the LTSP is to determine a sound method to determine the seismic design basis and not only to determine the seismic design margins.

2. L. Cluff, PG&E, presented background information on the Diablo Canyon LTSP which led to the Diablo Canyon Nuclear power plant

license condition. The LTSP is now scheduled to be completed in July 1989 after a delay of one year due to resources being diverted for legal hearings. L. Cluff stated that since our last progress report meeting, presentations of some aspects of the LTSP were made at professional society meetings i.e., Seismological Society of America, Geological Society of America and American Geophysical Union. One of the prime purposes for these meetings was to provide peer review.

3. L. Cluff, PG&E, presented the geology, seismology, and geophysics work plan. He stated that the plan was focused and data driven. Data was acquired from literature review; geological studies including marine and fluvial terraces, age dating and fault trenching; offshore and onshore geophysics including COMAPS high resolution near-shore study done by PG&E, Digicon/PG&E deep coastal survey; additional proprietary Western and Nekton CDP lines; reprocessing of selected lines; California State Lands data collected within a 3-mile limit from Diablo Canyon; and the Central Coast seismic network which is now fully operational. By analysis and interpretation of the above data, preliminary seismic source characterizations were obtained. The following are preliminary results:

- o The LTSP geology seismology and geophysics activities are emphasizing data interpretation leading to seismic source characterizations that integrate multidisciplinary data sets

and analyses, explicitly treat uncertainties, and address alternative source characterization models.

- o The San Miguelito and Edna faults are not capable according to Appendix A criteria.
 - o Pismo synclinorium has not been subject to active folding for the past 700,000 years or longer and is subject to block uplift. The San Luis/Pismo block is bounded by the dip-slip Los Osos fault along this northwestern edge. The Wilmer Avenue, Oceano, Pecho, and San Luis Bay faults are southwest of the block and are discontinuous and have very low slip rates. The Hosgri fault zone bounds the western edge of the block.
 - o The November 4, 1927 Lompoc earthquake was a nearly pure dip-slip event having strike about N23W and had a focal depth of 10 km. The seismic moment of the earthquake was 1×10^{26} , corresponding to a moment magnitude of 6.6. The surface wave magnitude was 7.0.
4. B. Tsai, PG&E, described the ground motion studies. The objectives were to 1) update the ground motion assessment for the site and 2) provide ground motion data for engineering analysis. Based on 1) an updated strong motion data base, 2) refined geology, seismology and geophysics information, 3) available ground motion recordings at the site, and 4) use of both empirical and numerical modeling, methods the following ground motion data were provided for engineering analyses:

- o For fragility analysis; 12 sets of empirical acceleration time histories and 14 sets of simulated acceleration time histories.
 - o For soil-structure interaction analysis; median site-specific spectral shape, 3 sets of candidate acceleration time histories to match the site-specific spectral shape and spatial incoherence functions.
5. W. White, Bechtel/PG&E, provided a brief overview of the seismic analysis that has been tailored to support PRA. Input requirements are 1) structural response; forces in structural elements, deflections, accelerations and response spectra, 2) equipment response; response spectra and deflections and 3) dispersion of response. Studies performed thus far includes the following;
- o Development of median and 84% floor response spectra of the auxiliary building,
 - o Development of median response spectra of all buildings,
 - o Effect of incoherent ground motion, and
 - o Effect of containment base uplift.
6. W. Tseng, PG&E, presented detailed information on 1) SSI response to coherent ground motion inputs (vertically propagating plane-seismic waves) and 2) SSI response adjustment factors due to spatial incoherence of ground motion. These analyses were applied to the containment structure, auxiliary building and turbine building, Unit 2.

7. R. Kennedy, RPK, Inc., presented information on Diablo Canyon fragility evaluation. He reviewed Phase II fragility studies. Essentially the fragilities are keyed to spectral accelerations in the 3 to 8.5 Hz range which provided a somewhat more accurate and less uncertain results. With respect to soil structure interaction, he stated that its effects are assumed to result only from statistical incoherence from the ground motion wave. For a 150 foot plan dimension at frequencies of 5, 10 and 25 Hz, the reduction factors are 1.0, 0.9 and 0.8 respectively. Probable dominant contributors from Phase II study indicate that the diesel generators plus peripherals and overall distress of the turbine building contributed most to the risk. Seismic risk is dominated by S_A between 1.75G - 2.75g, with a corresponding A_g between 0.75G - 1.45 g. Below a value of $S_A=1.75G$ ($A_G=0.75g$) the seismic risk only comes from seismic loss of offsite power coupled with random loss of onsite power. On the average, Phase III A HCLPF values are not substantially different from Phase II fragilities. In general, both medians and randomness have increased. Currently, the fragility estimates all of components are being revised to incorporate the following:

- o A more realistic site-specific spectra shape,
- o Median centered responses analyses for all buildings to site-specific spectra, and
- o Incorporation of soil structure interaction effects including spatial variation of ground motion.

8. B. Smith, PG&E, described the Diablo Canyon Probabilistic Risk Assessment study. The study involves:

- o Utilization of Pickard, Lowe and Garrick (PLG) as a lead PRA consultant
- o Performing a plant and site specific PRA that will rely heavily on PG&E knowledge and experience
- o Extensive PG&E involvement, management oversight of PLG, performing technical PRA work under PLG direction, and review of PRA models and results
- o Extensive training of PG&E personnel in PRA techniques
- o Transfer of PRA methodology from PLG to PG&E.

The first PRA iteration is about complete and the final iteration has been started. This year's activities (1988) include analysis of dominant contributors, final computer runs and final report writing.

The Diablo Canyon PRA features the following:

- o Relay chatter and recovery,
- o Enhanced seismic analysis,
- o Dynamic human actions analyses, and
- o Design and construction errors

Key engineering issues for the final phase investigation will include 1) RCP seal LOCA, 2) charging pump dependence on CCW, 3) fuel oil transfer

system, 4) relay chatter, 5) AC Power recovery following an earthquake and 6) a revised seismic analysis.

The best estimate result for mean core damage frequency (nonseismic events) is about a total of 7.6×10^5 /year, while the best estimate results from the initial fragility study of mean core damages frequency (seismic events) is about a total of 1.3×10^{-4} /year. These results may change slightly after the final studies are complete.

NOTE: Additional meeting details can be obtained from a transcript of this meeting available in the NRC Public Document Room, 1717 H St., NW., Washington, D.C. or can be purchased from Heritage Reporting Corporation, 1220 L Street, NW., Washington, D.C. 20005, (202) 628-4888.

11 a.m.—Recent activities in the Office of Commercial Programs.
 11:30 a.m.—SAAC Subcommittee Reports.
 1:15 p.m.—SAAC discussion: Recommendations and position statements.
 3 p.m.—Adjourn.

Ann Bradley,

*Advisory Committee Management Officer,
 National Aeronautics and Space Administration.*

February 1, 1988.

[FR Doc. 88-2377 Filed 2-4-88; 8:45 am]

BILLING CODE 7510-01-M

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards Subcommittee on Diablo Canyon; Meeting

The ACRS Subcommittee on Diablo Canyon will hold a meeting on February 23 and 24, 1988, at the Sheraton International (5 minutes from the San Francisco airport), 1177 Airport Boulevard, Burlingame, CA.

The entire meeting will be open to public attendance.

The agenda for the subject meeting shall be as follows:

Tuesday, February 23, 1988—8:30 a.m. until the conclusion of business
Wednesday, February 24, 1988—8:30 a.m. until the conclusion of business.

The Subcommittee will review the status of the Diablo Canyon Long-Term Seismic Program.

Oral statements may be presented by members of the public with the concurrence of the Subcommittee Chairman; written statements will be accepted and made available to the Committee. Recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Subcommittee, its consultants, and Staff. Persons desiring to make oral statements should notify the ACRS staff member named below as far in advance as is practicable so that appropriate arrangements can be made.

During the initial portion of the meeting, the Subcommittee, along with any of its consultants why may be

present, may exchange preliminary views regarding matters to be considered during the balance of the meeting.

The Subcommittee will then hear presentations by and hold discussions with representatives of the NRC Staff, its consultants, and other interested persons regarding this review.

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by a prepaid telephone call to the cognizant ACRS staff member, Mr. Elpido Igne (telephone 202/634-1414) between 8:15 A.M. and 5:00 P.M. Persons planning to attend this meeting are urged to contact the above named individual one or two days before the scheduled meeting to be advised of any changes in schedule, etc., which may have occurred.

Date: February 2, 1988.

Morton W. Libarkin,

Assistant, Executive Director for Project Review.

[FR Doc. 88-2515 Filed 2-4-88; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 50-440-OLA; ASLB^o No. 88-562-02-LA]

The Cleveland Electric Illuminating Co., et al.; Establishment of Atomic Safety and Licensing Board

Pursuant to delegation by the Commission dated December 29, 1972, published in the *Federal Register*, 37 F.R. 28710 (1972), and Sections 2.105, 2.700, 2.702, 2.714, 2.714a, 2.717 and 2.721 of the Commission's Regulations, all as amended, an Atomic Safety and Licensing Board is being established in the following proceeding to rule on petitions for leave to intervene and/or requests for hearing and to preside over the proceeding in the event that a hearing is ordered.

The Cleveland Electric Illuminating Company, et al.; Perry Nuclear Power Plant, Unit No. 1, Facility Operating License No. NPF-58

This Board is being established pursuant to a notice published by the

Commission on December 11, 1987, in the *Federal Register* (52 FR 47064-65) entitled, "Consideration of Issuance of Amendment to Facility Operating License and Opportunity for Prior Hearing." The proposed amendment would delete the provisions in the Technical Specifications relating to the Main Steam Isolation Valve (MSIV) Leakage Control System (LCS), and also revise the leakage criteria for primary containment allowable leakage through the main steam lines.

The Board is comprised of the following Administrative Judges:

Morton B. Margulies, Chairman, Atomic Safety and Licensing Board Panel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555

James H. Carpenter, Atomic Safety and Licensing Board Panel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555

Gustave H. Linenberger, Jr., Atomic Safety and Licensing Board Panel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555

Issued at Bethesda, Maryland, this 28th day of January 1988.

B. Paul Cotter, Jr.,

Chief Administrative Judge, Atomic Safety and Licensing Board Panel.

[FR Doc. 88-2513 Filed 2-4-88; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 50-219-OM; ASLB^o No. 88-563-01-M]

General Public Utilities Nuclear Corp.; Establishment of Atomic Safety and Licensing Board

Pursuant to delegation by the Commission dated December 29, 1972, published in the *Federal Register*, 37 FR 28710 (1972), and Sections 2.105, 2.700, 2.702, 2.714, 2.714a, 2.717 and 2.721 of the Commission's Regulations, all as amended, an Atomic Safety and Licensing Board is being established in the following proceeding to rule on petitions for leave to intervene and/or requests for hearing and to preside over the proceeding in the event that a hearing is ordered.

DIABLO CANYON LONG TERM SEISMIC PROGRAM
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS SUBCOMMITTEE MEETING
 FEBRUARY 23-24, 1988
 SHERATON HOTEL, 1177 AIRPORT BLVD.
 BURLINGAME, CALIFORNIA 94010
 (415) 342-9200

TENTATIVE AGENDATuesday, February 23, 1988

8:30 - 9:15 a.m.

Introductions

- . ACRS 8:30-8:40
- . NRC Staff 8:40-8:45
- . PG&E 9:00 Don Bryant VP

9:05 - 10:05

9:15 - 10:00 a.m.

Background - PG&E

- . The 1978 ACRS Letter
- . The License Condition
- . The LTSP Program Plan
- . The LTSP Scoping Study

10:00 - 10:15 a.m.

BREAK

10:15 - 11:00 a.m.

Background - PG&E (Continued)

11:00 - 12:00 NOON

Current Status of LTSP - PG&E*

- . Geology/Seismology/Geophysics cluff/Savage
- . Earthquake Ground Motions Tsai
- . Soil/Structure Interaction
- . Fragilities Kennedy
- . Probabilistic Risk Assessment B. Smith

12:00 NOON - 1:00 p.m.

LUNCH

1:00 - 2:00 p.m.

Current Status of LTSP - PG&E (Continued)

2:00 - 2:15 p.m.

BREAK

2:15 - 4:00 p.m.

Current Status of LTSP - PG&E (Continued)

Wednesday, February 24, 1988

8:30 - 10:30 a.m.

Current Status of LTSP - PG&E (Continued)

10:30 - 10:45 a.m.

BREAK

10:45 - 12:00 NOON

Closing Statements

- . NRC Staff
- . PG&E
- . ACRS

1:00 - 5:00 p.m.

Field Visit

- . For ACRS Members/Consultants interested in visiting Diablo Canyon Power Plant

* At the end of each section of review by PG&E, it is expected that NRC will briefly discuss its status of review.

LIST OF HANDOUTS

DIABLO CANYON, FEBRUARY 23-24, 1988 Subcommittee
Meeting

1. NRC Staff Presentation on Diablo Canyon Seismic Reevaluation - Bob Rothman, RES
- 1.a Background Material - Floyd Cluff, PG&E, Diablo Canyon
2. Geology/Seismology/Geophysics Work Plan - Floyd Cluff
3. Diablo Canyon Long Term Seismic Program, Gound Motion Studies
Ben Tsai, PG&E
4. Ground Motion - Analysis has been tailored to support PRA
5. Part I - SSI Responses to Coherent Ground Motion Inputs - Wen Tseng,
PG&E
6. Diablo Canyon Fragility Evaluation - R. P. Kennedy, February 1988
7. Diablo Canyon Probabilistic Risk Assessment - Bruce Smith