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

April 9, 1984

Docket No. 50-275

MEMORANDUM FOR: Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

FROM: William T. Russell, Deputy Director
Division of Human Factors Safety

SUBJECT: DIABLO CANYON INITIAL TEST PROGRAM CHANGES

References:
(a) Letter from J. Schuyler (PG&E) to D. Eisenhut dated August 19, 1983
(b) Memorandum from D. Ziemann to G. Knighton dated March 23, 1984
(c) Safety Evaluation Report NUREG-0675 Supplement 14, Section I.G.1

TACS 54492 dated March 23, 1984, requests evaluation of FSAR Chapter 14 initial test program changes proposed in Reference (a). The proposed changes are acceptable; however, the licensee should further revise Chapter 14 to include a Loss of Offsite Power with Loss of Turbine-Generator Test (see Reference b) and natural circulation tests (see Reference c).

Our SER and SALP inputs are enclosed.

for Dennis L. Ziemann
William T. Russell, Deputy Director
Division of Human Factors Safety

Enclosures:
1. SER Input
2. SALP Input

cc w/enclosures:
G. Knighton
B. Buckley
H. Schierling
P. Morrill

TA
8404200202
4pp
B/11

SAFETY EVALUATION REPORT INPUT
DIABLO CANYON UNIT 1

14.0 INITIAL TEST PROGRAM

In a letter from J. O. Schuyler to D. G. Eisenhut dated August 19, 1983, the licensee requested NRC approval for changes to the startup test program described in FSAR Chapter 14. NRC approval of startup test program changes is required by paragraph 2.C(3)a of the Facility Operating License.

Change No. 1 would delete the "Reactor Coolant Chemistry" startup test. The licensee states that similar testing was performed during preoperational testing. This change is acceptable based on accomplishment of the test objectives.

Change No. 2 would revise the "Nuclear Design Check" startup test to expand the objectives to include zero power flux distribution testing at various control rod configurations. This change is consistent with RG 1.68, Appendix A.4.e, and is acceptable.

Change No. 3 would revise the "Power Reactivity Coefficient and Integral Power Defect Measurements During Power Level Increase" startup test to include a Doppler Temperature Coefficient measurement in lieu of a Power Reactivity Coefficient measurement. Due to inaccuracies involved in the test method for direct measurement of power coefficient, the revised test provides a more accurate verification of the actual power coefficient. This change would be consistent with NSSS vendor recommendations and is acceptable.

Change No. 4 would delete the "Steam Generator Water Level Control" startup test as a separate test, and include it as part of the "Automatic Controls Systems Checkout" test. Since no test objectives would be eliminated, this change is acceptable.

Change No. 5 would delete from the FSAR, the "Main and Reheat Steam System" test. The licensee states that this testing will be accomplished during

"baseline performance" testing of the secondary plant. Also, FSAR Table 14.1-2 states that the steam dump control system and turbine control system will be tested during the Automatic Control Systems Checkout. Since adequate testing will be performed in conjunction with other tests, this change is acceptable.

Change No. 6 would revise the sequence and power levels of various startup tests in accordance with the NSSS vendor's philosophy. Based on continued conformance with RG 1.68, these changes are acceptable.

In summary, the staff concludes that the FSAR Chapter 14 changes requested by the licensee's August 19, 1983 letter are acceptable.

SALP INPUT

Plant: Diablo Canyon

Licensee: Pacific Gas & Electric Company

Functional Areas: SRP 14.2 Initial Test Program

1. Management Involvement in Assuring Quality

   No basis for rating.

2. Approach to Resolution of Technical Issues from a Safety Standpoint

   The licensee's August 19, 1983 letter provides a generally sound approach to startup tests.

   Rating: Category II

3. Responsiveness to NRC Initiatives

   The licensee provided timely response to NRC's request for clarification of the change to Test 4.3 (Letter of August 19, 1983).

   Rating: Category I

No basis for rating other functional areas.

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

APR 0 9 1984

MEMORANDUM FOR: James P. Knight, Assistant Director for Components & Structures Engineering, DE

FROM: Robert E. Jackson, Chief
Geosciences Branch, DE

SUBJECT: DIABLO CANYON SEISMIC LICENSE CONDITION

On April 4, 1984, I met briefly with Drs. Seiss and Okrent regarding the Commission's request that we solicit the ACRS' input on the Diablo Canyon seismic license condition elements. I indicated to them what we had proposed and they indicated that they thought we should require a full PRA with seismic included in it. We will need to have further discussion on this issue. They indicated that they would be receptive to having a Diablo Canyon subcommittee meeting for 3 hours on the evening of June 13, 1984. They further indicated that we should meet with the applicant to attempt to work out a detailed program as soon as possible. They will then review and comment on what we and the applicant propose.

I will proceed to develop a plan including meeting with the applicant and USGS as appropriate.

Robert E. Jackson, Chief
Geosciences Branch
Division of Engineering

cc: H. Denton
R. Vollmer
T. Sullivan
D. Eisenhut
T. Novak
[redacted]
A. Thadani
G. Lear
D. Wheeler
L. Reiter
S. Brocoum
R. McMullen
D. Gupta
H. Polk
R. Rothman

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

April 12, 1984

MEMORANDUM FOR: Chairman Palladino
Commissioner Gilinsky
Commissioner Roberts
Commissioner Asselstine
Commissioner Bernthal

FROM: William J. Dircks
Executive Director
for Operations

SUBJECT: REVIEW OF DIABLO CANYON
PIPING ISSUES

The attached report is provided for your information in regard to the Diablo Canyon meeting with the Commission on April 13.

William J. Dircks
Executive Director
for Operations

Attachment:
Memo to W. Dircks fm R. Vollmer
RE: Report of the Review Group
on Diablo Canyon Piping Issues
dtd 4/12/84

cc: SECY
OGC
OPE
ELD

[redacted] B/13

[redacted]

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4p.

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

April 12, 1984

MEMORANDUM FOR: William J. Dircks
Executive Director for Operations

FROM: Richard H. Vollmer, Director
Division of Engineering
Office of Nuclear Reactor Regulation

SUBJECT: REPORT OF THE REVIEW GROUP ON DIABLO CANYON PIPING ISSUES

On March 29, 1984 you directed that a comprehensive review be initiated with respect to the large and small bore piping issues raised by Mr. Yin. This memorandum describes the activities that have been undertaken by the review group, the technical issues involved, and the activities envisioned for completing this effort. The members of the review group are shown in Enclosure 1. A chronology of the meetings held by the review group and related actions is contained in Enclosure 2.

The purpose of the various review group meetings with Mr. Yin, PG&E and the IDVP staff was to develop an understanding of the issues and to focus both on generic implications and the significance of the issues as they deal with low power operation. Since the review group's time was very limited, it did not review any design, procedural, or quality assurance paperwork and did not attempt to close out any of the issues since they will be closed out as part of the normal inspection process. The review group did, however, examine installed piping and supports inside and outside containment in areas of concern to Mr. Yin.

The review group also met with Mr. Charles Stokes, a former PG&E employee, who filed a number of allegations which formed a basis for the areas investigated by Mr. Yin.

The issues raised can be placed into two broad categories: programmatic design control and technical design issues. In some cases these issues are interrelated and not completely separable.

The programmatic design control issues were grouped into the following three areas:

1. Training of small bore piping and pipe support engineers. For example, the inspection report notes that these engineers did not always receive prescribed project training within the time set by PG&E procedures.

2. Procedure control and control of design change documents. Cases were noted, for example, where engineers were using out-of-date

procedures and where documents not controlled under the quality assurance program were used to transmit design information.

3. The conduct of audits and the follow up and closure of audit findings.

The technical design issues were grouped into seven areas:

1. Deficiencies in small bore support computer calculation packages. These deficiencies ranged from missing documentation to the need for recalculation because of improper technical input. (To date, no reworking of supports has been required from the reviews of these packages.)

2. Placement of snubbers adjacent to rigid restraints and anchors.

3. Placement of closely spaced rigid restraints. The concern arising from this practice is that loading may not be shared between adjacent supports as intended.

4. Adequacy of piping inservice performance with respect to clearances that may be closed due to thermal expansion.

5. Acceptability of the PG&E allowable loads used for U-bolts in pipe supports. (This concern was raised primarily through discussions with Mr. Stokes.)

6. Design adequacy of certain types of support members when subjected to torsional loadings. (This concern was also raised by Mr. Stokes.)

7. Possible excessive use of snubbers in the plant.

Conclusions

On the basis of a discussion of these issues with Mr. Yin, PG&E, the IDVP staff and physical inspection at Diablo Canyon, Unit 1, in addition to a review of associated documentation, the review group, both individually and collectively, came to the following conclusion on the issues raised:

> That these issues should not preclude criticality and operation at low power; and
>
> That these issues alone did not demonstrate a generic problem with respect to a breakdown of quality assurance or design and construction effectiveness.

The review group believes, however, that a number of actions are required prior to the full power licensing decision to provide the necessary basis for full power operation. These actions, which were discussed in detail at the ACRS meeting on April 6, 1984, should be made conditions of the Diablo Canyon license:

A. Complete the PG&E review of the small bore support computer calculation packages and an NRC audit of this activity;

B. Complete any necessary modifications to supports placed in close proximity to rigid pipe supports or anchors, and an NRC audit of this activity;

C. Establish a program acceptable to the NRC staff for monitoring thermal gaps, as necessary;

D. Establish a program acceptable to the NRC staff for review of the programmatic issues called "quick fix" and "Diablo Problem" and determine the implications of their possible misuse;

E. Staff inspection of the mainsteam and main feedwater hot walkdown;

F. Complete the NRC staff review of the technical allegation issues associated with the design of piping and support work; and

G. Complete the planned inspection efforts related to the design of piping and pipe supports.

The review group believes that few hardware changes will be required as a result of these follow up actions and that low power operation will have only a minimal effect on making these changes. (Enclosure 3 provides an analysis of the affect of low power operation on personnel exposure levels.)

In the attached letter to Chairman Palladino of April 9, 1984, the ACRS stated that it is acceptable to permit low power operation and that the recommended actions should be completed before operation at full power. In additional comments provided in that lettter, the staff was requested to document in considerable detail how the various relevant issues

raised by the inspectors and others have been handled. We are currently developing a program to respond to these ACRS requests.

Approved by the Review Group:

R. H. Vollmer, NRR

D. P. Allison, IE

R. J. Bosnak, NRR

B. H. Faulkenberry, R-V

R. F. Heishman, IE

J. P. Knight, NRR

K. A. Manoly, R-I

B. F. Saffell, Battelle

E. J. Sullivan, NRR

J. M. Taylor, IE

Enclosures:
1. Review Group
2. Chronology of Activities
3. Memo on Low Power Radiation Exposure dtd 4/5/84
4. ACRS letter dtd 4/9/84

Review Group on Diablo Canyon Piping Issues

R. H. Vollmer
Director, Division of Engineering, NRR

D. P. Allison
Section Chief, Section B, Division of Emergency Preparedness, IE

R. J. Bosnak
Chief, Mechanical Engineering Branch, NRR

B. H. Faulkenberry
Deputy Regional Administrator, Revion V

R. F. Heishman
Chief, Reactor Construction Programs Branch, Division of Quality Assurance Safeguards and Inspection Programs, IE

J. P. Knight
Assistant Director, Components and Structures Engineering, NRR

K. A. Manoly
Reactor Engineer, Engineering Programs Branch, Region I

B. F. Saffell
Program Manager, Battelle Columbus Laboratories

E. J. Sullivan
Technical Assistant, Division of Engineering, NRR

J. M. Taylor
Deputy Director, IE

Chronology of Review Group Meetings and Related Actions

March 30, 1984	Meeting with I. Yin to discuss inspection report.
April 2, 1984	Transcribed meeting with PG&E in San Francisco to discuss inspection findings.
April 3, 1984	Diablo Canyon site tour to observe examples of piping and supports at issue.
April 3, 1984	Meeting with C. Stokes to discuss allegations.
April 3, 1984	Draft inspection report issued in Board Notification No. 84-071.
April 5, 1984	Meeting with I. Yin to discuss review group findings.
April 6, 1984	Transcribed meeting with ACRS
April 9, 1984	ACRS letter on Diablo Canyon low power license issued.
April 10, 1984	Transcribed meeting with Charles Stokes to further discuss technical issues.
April 11, 12, 1984	Meetings to plan and program work to resolve issues.
April 13, 1984	Meeting with Commission

Enclosure 3

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

APR 5 1984

MEMORANDUM FOR: Richard Vollmer, Director
Division of Engineering

FROM: Frank J. Congel, Chief
Radiological Assessment Branch, DSI

SUBJECT: DIABLO CANYON RADIATION EXPOSURE LEVELS EXPECTED AT LOW POWER

RAB has provided estimates of radiation exposure levels in reply to your request for an estimate of expected personnel radiation exposure during Diablo Canyon plant walk down to inspect seismic provisions for adequancy. Our estimates were based on the following assumptions:

(1) The inspection will begin at least 24 hours following the first plant shut down from not more than 10% reactor power operation,

(2) The inspection will be conducted in compliance with ALARA policy,

(3) One person will be exposed to radiation,

(4) Fuel assemblies in the core will be essentially leak free, and

(5) Inspection will exclude the vicinity of reactor vessel cavity.

Data and experiences gained previously from other facilities during similar conditions were adjusted to this particular case. The results show that average radiation levels in the vicinity of most seismically affected piping at Diablo Canyon should be less than 1 mRem/hr. Thus, assuming personnel exposure time of ~10 hours, the average personnel exposure should be approximately 10 mRem.

Higher personnel exposure could be expected in the case that reactor water cleanup system was in operation during 10% reactor power (one or two days long) operation. Radiation fields in the vicinity of the cleanup system components could reach in such case, the R/hr range. Thus, in this case a total personnel exposure of approximately 100-200 mRem could be expected.

Frank J. Congel

Frank J. Congel, Chief
Radiological Assessment Branch
Division of Systems Integration

cc: . Mattson
J. Muller
O. Lynch
F. Skopec

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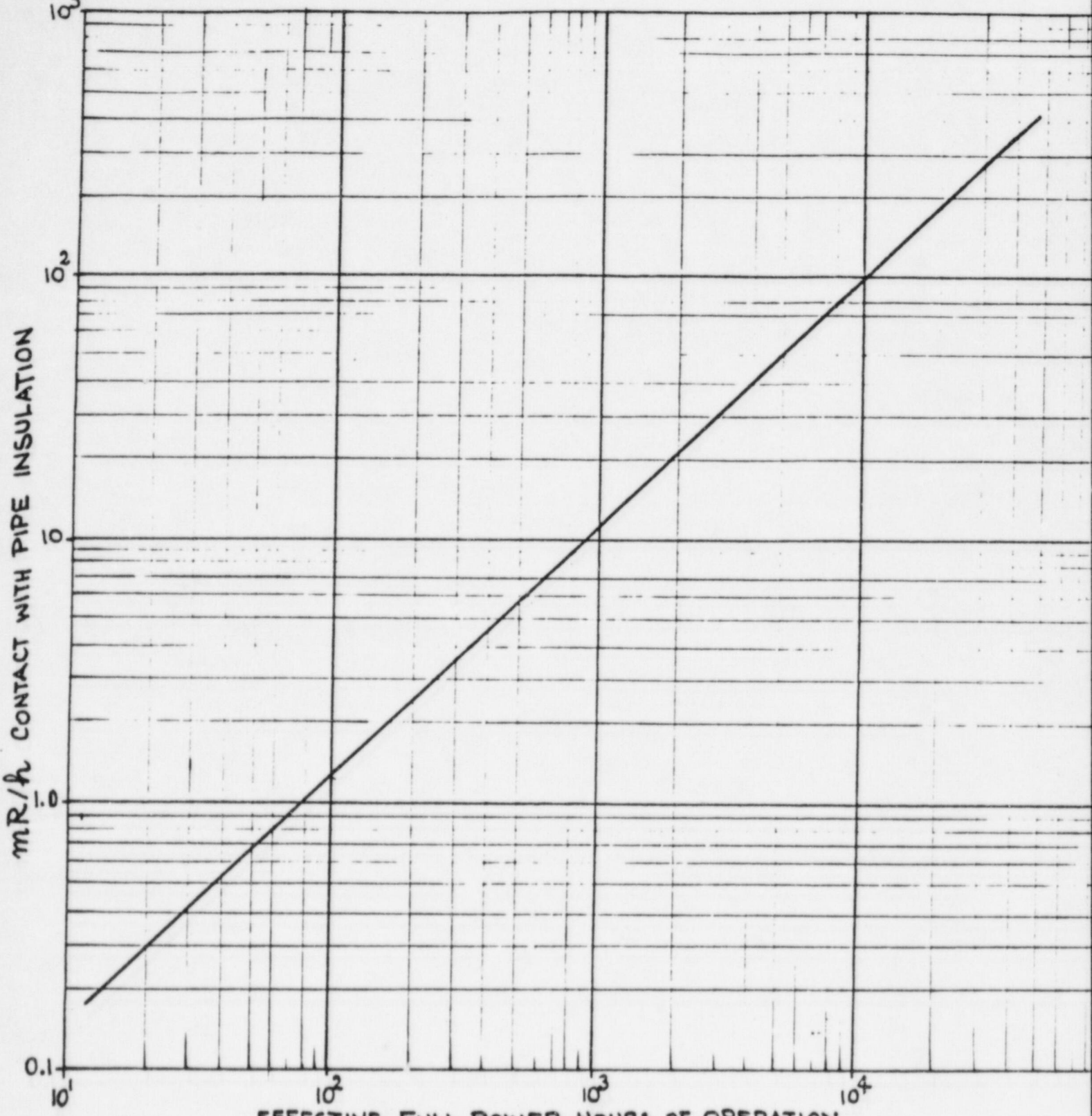

SHUTDOWN RADIATION LEVELS-LONG ACTIVITY

PRIMARY COOLANT RECIRCULATION PIPES

Enclosure 4

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 9, 1984

Honorable Nunzio J. Palladino
Chairman
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS REPORT ON DESIGN CONTROL MEASURES AT THE DIABLO CANYON NUCLEAR POWER PLANT

During its 288th meeting, April 5-7, 1984, the Advisory Committee on Reactor Safeguards reviewed the technical issues arising from the Diablo Canyon Licensee's design control measures for small and large bore piping, as requested in your letter dated April 4, 1984. During this review we had the benefit of presentations by members of the NRC Staff, including NRC Inspector Isa Yin, by representatives of the Pacific Gas & Electric Company (Licensee) and of the Independent Design Verification Program organizations, and by Mr. Charles Stokes, a member of the public. We also had the benefit of the documents listed.

We were informed that there is no longer disagreement between the NRC Staff and Mr. Yin. They now agree on a series of actions that must be completed by the Licensee and by the NRC Staff to resolve certain questions, and agree that these should be completed before operation at full power. They agree also that operation and low power testing at levels up to five percent of full power can be permitted without undue risk to the health and safety of the public.

We agree that it is acceptable to permit low power operation at this time. We believe that such operation will not compromise corrective actions that may be required.

We believe that the several actions proposed by the NRC Staff for completion before operation above five percent power will provide a suitable basis for considering operation at full power.

The Licensee has agreed to the actiors proposed by the NRC Staff before operation above five percent power with one exception. This exception relates to the need for or desirability of "hot shimming" for closely spaced restraints on large bore piping. We believe that this requirement deserves further technical review and discussion between the NRC Staff and the Licensee.

~~8404100506~~

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We understand that allegations such as those made by Mr. Stokes will be investigated and appropriately considered by the NRC Staff.

Additional comments by ACRS members Robert Axtmann, Jesse Ebersole, and David Okrent are presented below.

Sincerely,

Jesse C. Ebersole
Chairman

Additional Comments by ACRS members Robert Axtmann, Jesse Ebersole, and David Okrent

We agree with the ACRS conclusion on operation at five percent power.

In view of the limited time available for review of this matter, the bulk of documentation, and the lateness of some documents in reaching us, our review was of necessity limited in its depth.

Prior to an ascent in power above five percent, the NRC Staff should prepare a document discussing in considerable detail how the various relevant issues raised by its inspectors and others have been handled. The NRC Staff should also perform a careful examination of a selected sample of actual construction details to help assure that the appropriate quality has been accomplished.

We believe the ACRS should be given an opportunity to review these results prior to the achievement of full power at the Diablo Canyon Nuclear Power Plant.

References:

1. U. S. Nuclear Regulatory Commission Transcript of the March 26 and 27, 1984 meeting in the matter of Discussion/Possible Vote on Diablo Canyon Criticality and Low Power Operation, Pages 68-102, 233-256, 263, 279, and 281-287
2. U. S. Nuclear Regulatory Commission Transcript of the March 28, 1984 meeting between Staff, Applicant and Intervenor on Diablo Canyon, Pages 1-124
3. U. S. Nuclear Regulatory Commission Transcript of the meeting on April 2, 1984 in the matter of Pacific Gas & Electric Company on Diablo Canyon, Pages 1-272
4. I. T. Yin, "Diablo Canyon 1, Summary of Findings Resulting From Follow-up of Allegations and NRC Independent Overview," Draft dated March 29, 1984

5. I. T. Yin, "Diablo Canyon 1, Draft Investigation/Inspection Report," Rev. 3, dated March 29, 1984
6. Memorandum, with enclosure, from Darrell G. Eisenhut, Director, Division of Licensing, U. S. Nuclear Regulatory Commission, to Chairman Palladino and Commissioners, U. S. Nuclear Regulatory Commission, Subject: Diablo Canyon - Allegations Concerning Small Bore Piping and Supports (Board Notification No. 83-171), dated October 27, 1983
7. U. S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the Operation of Diablo Canyon Nuclear Power Plant, Units 1 and 2," USNRC Report NUREG-0675, Supplement No. 22, dated March 1984
8. Exhibit A, "Affidavit of Charles Stokes," dated November 1983 to Motion to Atomic Safety and Licensing Appeal Board, "Joint Intervenors' Motion to Augment or, in the Alternative, to Reopen the Record" in the Matter of Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), dated February 14, 1984
9. Pacific Gas and Electric Company's Answer in Opposition to Joint Intervenors' Motion to Augment or, in the Alternative, to Reopen the Record in the Matter of Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2) without attachments, dated March 6, 1984
10. Letter No. DCL-84-131, from J. O. Schuyler, Pacific Gas and Electric Company to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, Subject: Response to Board Notification 84-071 on Diablo Canyon Unit 1, dated April 4, 1984
11. Summary of Remarks of Charles Stokes Before the Advisory Committee on Reactor Safeguards Concerning the Diablo Canyon Nuclear Power Plant, dated April 6, 1984
12. Letter No. P105-6 from Robert L. Cloud, Robert L. Cloud Associates, Inc., to Mr. G. A. Maneatis, Pacific Gas and Electric Company, Mr. H. R. Denton, U. S. Nuclear Regulatory Commission, and Mr. J. B. Martin, Region V, U. S. Nuclear Regulatory Commission, regarding allegations at Diablo Canyon, dated February 3, 1984

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

APR 12 [redacted]

MEMORANDUM FOR: [redacted]
Licensing Branch No. 3
Division of Licensing

FROM: Robert E. Jackson, Chief
Geosciences Branch
Division of Engineering

SUBJECT: DRAFT SEISMIC LICENSE CONDITION FOR DIABLO CANYON

Please find attached the proposed seismic license conditions for Diablo Canyon. These conditions are in draft form and will be the basis for discussions with the utility and ACRS. A meeting with the applicant should take place in the next several weeks. The ACRS meeting is scheduled for June 13, 1984 and with the Commission on July 19, 1984.

Robert E. Jackson, Chief
Geosciences Branch
Division of Engineering

Attachment:
As stated

cc: w/attachment
R. Vollmer
T. Sullivan
G. Lear
S. Brocoum
L. Reiter
R. Rothman
R. McMullen
D. Gupta
H. Polk

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3/14 [redacted]

Diablo Canyon Nuclear Plant License Conditions

PG&E shall develop and implement a State-of-the-Art Program to revalidate the seismic design bases used for Diablo Canyon. PG&E shall submit for NRC staff review and approval the proposed Program Plan and proposed schedule for implementation by January 30, 1985. The program shall be completed and final report submitted to the NRC by July 1, 1988.

The program shall consist, at a minimum, of the following proposed conditions:

(1) The applicant shall identify, examine, and evaluate all relevant geologic and seismic data, information, and interpretations that have become available since the 1979 ASLB hearing, including but not limited to the following:

(a) data collected as a result of research by government agencies and others, and as a result of extensive oil exploration off the coast and onshore in central California since 1978, including seismic reflection data, geological mapping, and exploratory well boring logs;

(b) reprocessed, pre-1979 seismic reflection data obtained by PG&E during licensing activities, and by the USGS during research activities. These data will be selected in critical areas based on the results of (a), and reprocessed using modern techniques.

The final results of these efforts will be used as input to Condition (2).

(2) PG&E shall reevaluate the magnitude of the safe shutdown earthquake. This element shall include reevaluation of the maximum earthquake for the Hosgri fault and also evaluation of the maximum earthquake on any other capable fault in the site region which might be considered as controlling for the ground motion. The parameters to be considered in this reevaluation are:

(a) Fault length to estimate magnitude
(b) Rupture length to estimate magnitude
(c) Slip rate to estimate magnitude
(d) Maximum displacement from a single event to estimate magnitude
(e) Historical seismicity
(f) Other approaches, such as total area of fault to estimate magnitude.

(3) PG&E shall revalidate the ground motion at the site based on the magnitude of the safe shutdown earthquake.

(a) Perform regression analysis of spectral values to get estimates of both horizontal and vertical spectra for Diablo Canyon (DCNPP) site specific conditions.
(b) Estimate site specific horizontal and vertical spectra.
(c) Perform earthquake numerical modeling study using the most recent techniques calibrated to a suite of nearfield data.

(d) Consider and evaluate the relevant soil-structure interaction effects such as, but not limited to, embedment and foundation averaging. Both analytical and empirical techniques may be appropriate.

All of the above will take into account the site specific conditions valid for DCNPP such as: distance to the fault, focal mechanism, attenuation and site geology.

(4) PG&E shall assess the significance of conclusions drawn from seismic reevaluation and revalidation studies in item 1, 2 and 3, utilizing the following two elements:

(a) PG&E shall perform an up-to-date realistic seismic probabilistic risk assessment (PRA) assuming the seismic capacity of the plant as it is actually constructed. The PRA shall adequately represent the uncertainty involved and include estimates of core-melt and consequences to the public of different ground motion levels up to and beyond the existing seismic design basis.

(b) If the results or the scope of the PRA indicate the need, PG&E shall also make deterministic estimates of seismic capability of selected structures, systems or components to better estimate existing seismic margins.

PG&E shall keep the staff informed on the progress of the revalidation program by quarterly progress reports and by semi-annual meetings in Bethesda. The applicant will also present annual progress reports to the ACRS subcommittee on Diablo Canyon.

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

JUL 11 1984

Docket No. 50-275

MEMORANDUM FOR: Richard H. Vollmer, Director
Division of Engineering
Office of Nuclear Reactor Regulation

FROM: James M. Taylor, Deputy Director
Office of Inspection & Enforcement

SUBJECT: EFFECTIVENESS OF QA PORTION OF THE DIABLO CANYON IDVP

In your memorandum of June 25, 1984, you requested confirmation that, for the extent of the Reedy audit of the Diablo Canyon IDVP, the findings of the audit were not in conflict with Mr. Yin's findings. Our assessment is that the RFR, Inc. audit results do not conflict with Yin's findings.

Based on your request and a telephone conversation on the afternoon of July 2 between Ted Sullivan of your staff and Jack Spraul of the QA Branch, we have reviewed the enclosures of your memo (particularly ITR-41) and Mr. Yin's findings as reported in his March 29, 1984 "Draft Investigation/Inspection Report," and his draft summary of findings of the same date. A comparison is given in the enclosure to this memorandum. The left column of the enclosure lists Mr. Yin's draft "Summary of Findings...." dated March 29, 1984. The right column reflects similar findings of the RFR, Inc. audit taken from ITR 41, Appendix G, "Corrective Action Program Conditions and Resolutions."

We conclude that the Yin audits and the RFR, Inc. audits located some similar areas of concern. For example, Mr. Yin's finding A indicates that he found inadequate indoctrination and training. RFR, Inc. reports a similar concern based on a review of training records.

There are areas in the right column of the enclosure where specific findings of Mr. Yin are not reflected in ITR-41. There is, however, some correspondence in 7 of the 8 general areas of Mr. Yin's concerns. In light of the sampling nature of the audit process, specific findings of Mr. Yin not being reflected in ITR-41 is not surprising. If the roles were reversed (i.e., if the ITR-41 findings were listed and the correspondence of Mr. Yin's findings shown) similar comments would be observed. Thus, we conclude that the specific findings of the RFR, Inc. audit do not appear to be in conflict with Mr. Yin's findings. Since Mr. Yin's audits (11/83-3/84) were conducted about a year after the RFR, Inc. audits (10/82-3/83), this could reflect a lack of effective corrective action.

Any questions on the above should be addressed to Jack Spraul on X-24530.

~~8407170285~~

James M. Taylor, Deputy Director
Office of Inspection and Enforcement

Enclosure: As stated 5pp.

[redacted]

3/15

Mr. Yin's Findings	Corresponding RFR, Inc. Findings
A. There were inadequate provisions in the program for personnel indoctrination and training. The small bore pipe support engineers were not familiar with important elements in both the QA and technical programs.	
1. In the area of general technical and QA training, the program permits personnel performing safety-related design work w/o training up to 30 days.	A review of training records revealed that 9 engineers who had been scheduled for training at least three times since September 22, 1982 had not yet attended the training session. Also, one of three Bechtel staff members had not been to a training session and the personnel records were not complete for the three staff members.
2. No measures or program provisions establised to ensure adequate special training for the working staff on matters such as procedure revisions and problem trendings.	
B. QA program deficiencies and design nonconformances had not been identified and corrected promptly.	
1. Site design organization management was insensitive to staff concerns, and did not initiate timely corrective actions.	Engineering non-conformance (Deficiency Reports, DR) do not appear to have been reviewed in a timely manner by QA; many DRs were observed to be past the close-out date. No evidence of requests for extensions of close-out dates could be located. (The time extensions are required to be initiated by the Engineering Chiefs).
2. Lack of project timely response to PG&E QA findings. The delays were w/o justification.	Follow-up action had not yet been taken at the time of the audit.
3. Lack of PG&E management attention to ensure timely responses to the audit findings.	A report for the first audit of DCP Site Engineering conducted by PG&E appeared not to have been issued within 30 days as required.
4. Bechtel audit finding corrective action scheduled completion dates were delayed without documented justification.	
5. Lack of PG&E audit finding corrective actions to identify the cause of the problem and the measures needed to prevent recurrence.	
6. Project corrective action only addressed specific problem areas identified in the PG&E audit findings and did not consider generic implication of the problems. QA concurred with this apparently inadequate corrective action.	
7. Inadequate Bechtel QA verification of OPEG corrective actions prior to close-out of audit findings. OPEG Personnel training continued to be inadequate.	
8. Lack of PG&E QA program measures to evaluate the effects of program efficiencies resulting in long delay of QA finding corrections prior to IDVP and CAP actions.	
C. Document control deficiencies were observed at the site design organizations.	The manual of implementing Procedures, Instructions and Design Criteria Memoranda (DCM) had instances of non-compliance with the requirements of EMP 5.2 for procedure preparation, approval, issue, and control. Fourteen examples cited.
1. Engineers were using out-of-date procedures for performing calculations.	
2. Inter-office memorandums were issued in lieu of procedures that bypassed review and approval process.	Appendix J & K to DCM M-9 had been replaced by memos.
3. Site Quality Engineer and Support Group Leader maintained outdated listings of the latest work procedure.	General comment - The date of effectivity, as listed in the Table of Contents, was not specified in or on the Procedure Cover Sheet. The "Approved by" signature last entered did not always agree with the Table of Contents effectivity date.

4. Design personnel was performing calculations without having adequately controlled procedures for extended periods of time.

Procedureal definition for small bore piping design packages had not yet been issued.

Eighteen receipt acknowledgment cards had not been returned.

These generic DCN's had not followed the consultant and safety review requirements of procedure 3.60N.

D. There had been inadequate or lack of procedures for the design organizations.

Procedural definition for small bore piping design packages had not yet been issued.

1. Lack of provision to handle and resolve field initiated design questions and requests by the PG&E home office.

There was no documented statement identifying which designs were required to have design verification by the Site Engineering Group.

2. Lack of prescription of the limited conditions where piping thermal stresses could be released by installation of gaps within rigid restraints.

3. Inadequate stress walkdown inspection program to ensure freedom of interferences. Procedures did not fully incorporate IEB 79-14 requirements, and the acceptance criteria were relying on design piping movement predictions that were not always observed to be accurate.

4. Ways that support joint loading can be reduced at structure connection were not prescribed. Unacceptable pin joint models were observed.

5. Lack of "Tolerance Clarification" procedural prescription on what could be "quickly fixed" at site without major revision of the existing calculations.

6. Lack of sufficient references and engineering data for the site engineers to perform calculations that had resulted in personnel reliance on uncontrolled outside materials.

E. Deficiencies observed that could have been the results of personnel not following the procedures.

Several instances noted where procedures were not followed. For example:

The Signature Register had not been completed.

No evidence could be found that the Chief responsible for the Piping Discipline had provided formal DCCL approval at the time of the audit.

1. Lack of S/B support calculation checks resulted in errors unrevealed.

2. "Preliminary" data identification and subsequent review of the calculation against final data were not done.

3. Personnel Training was not requested by the supervisors in a timely manner.

4. Stress walkdown inspections failed to identify all unintentional piping restraints.

F. There had been design control deficiencies identified during the program review and hardware inspections.

1. Design criteria conflict in control of pipe support structural frequencies.

2. Inadequate design evaluation of as-built deviations from design.

3. Lack of program provisions to control preliminary design data provided through telephone, and to verify the calculation against subsequent final data when made available.

4. There was no design consideration for synchronizing loading between closely spaced rigid/rigid restraints, and rigid restraint/anchors.

5. Snubbers were inoperable due to placing them in close proximity with rigid restraints and anchors.

6. Lack of ALARA considerations associated with the use of snubbers.

7. Lack of documented design interface procedure for OPEG Piping Stress Group and Pipe Support Group.

8. Support field design change breakdown.

Quick acceptance and fixes of design deviations bypassed measures including prior caculations made, review, and approval. There had been thousands of supports being "fixed" this way.

G. Inadequate licensee technical QA audits and surveillances to identify and correct the design control and program deficiencies revealed during this inspection/investigation.

A management audit had not been conducted and had not been scheduled at the time of the audit.

1. When a QA audit item could not be evaluated due to a lack of project activities, followup of the item was not planned.

2. Lack of QA audit documentation of specific materials reviewed that leads to closing out of the audit findings.

3. Lack of QA documentation of materials reviewed during the conduct of the audit.

4. Lack of technical QA audits to independently verify that OPEG calculation inputs were checked to be in compliance with engineering procedures.

The following conditions were found from auditing calculations:

1. Some signatures missing;
2. Not all pages numbered;
3. Calculation indexes incomplete;
4. References incomplete. (The source of input data was not always shown); and
5. A list of items which establish "Preliminary Status" was not included.

5. Auditor did not take the initiatives to investigate why there had not been any Discrepancy Reports issued by the site design group.

6. Relative to a document control audit, the auditor discovered that, since March, 1983, the control of OPEG procedures was conducted at the PG&E and Bechtel, San Francisco offices. There was no attempt made to revise the audit checklist to cover these activities.

7. Relative to the same document control audit, the checklist was modified to cover the subject OPEG activities, 10 months later the benefit of timely audit to ensure program compliance had been compromised.

H. Inadequate PE&E and Bechtel control of procured engineering services.

1. Lack of procedure to ensure effective design interface between PG&E and Westinghouse.

2. Lack of DCP control of procedures to be used by the contractors.

   a. Lack of measures to ensure that contractors had received required design criteria.

   b. Lack of justification on unrequired criteria and procedures being sent to the contractors.

3. Relative to DCP audit of contractors, technical audits of Imprell, Cygna and Westinghouse had not been performed.

4. Design procedures and instructions utilized by Imprell, Cygna, and Westinghouse had not been reviewed and approved by the PG&E and Bechtel engineering and QA departments.

5. PG&E did not perform QA program type audits of Westinghouse in 1983, when most of the CAP analytical work was carried out.

6. The PG&E QA program audit of Westinghouse, No. 20506, "Seismic Re-Verification," conducted on May 25-28, 1982, did not include a review of piping analysis and pipe support calculation to ensure implementation of procedureal requirements.

7. Relative to contractor internal audits, Cygna technical review for design analysis and calculation was questionable.

8. Relative to contractor internal audits, the Westinghouse QA program type audit was considered to be inadequate and deficient.

9. Relative to contractor internal audits, there had not been any technical audits conducted by Westinghouse.

One supplier, TERA, had been reviewed and approved as required, but not yet audited to confirm the implementation of the QA Program. ANCO was only conditionally approved with follow-up action required. A Corrective Action Request was outstanding regarding Quadrex.