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 Cases were noted, for example, where engineers were using out-of-date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:

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R. J. Bosnak, NRR

B. H. Faulkenberry, R-V

R. F. Heishman, IE

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E. J. Sullivan, NRR

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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

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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