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EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards addl info on License Condition 2.C.(11) technical issues re large & small bore piping supports & IDVP review piping work,per NRC 840620 request.

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Division of Licensing

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J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

June 26, 1984

PGandE Letter No.: DCL-84-238

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
Additional Information Regarding Piping and Supports

Dear Mr. Eisenhut:

Enclosed are PGandE's responses to the information requested in your letter dated June 20, 1984. PGandE is providing additional information on License Condition 2.C.(11) technical issues relating to large and small bore piping and pipe supports, IDVP review of piping work, and a discussion of various activities associated with the Onsite Project Engineering Group (OPEG).

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

for J. O. Schuyler

Enclosures

cc: J. B. Martin
H. E. Schierling
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ENCLOSURE 1

RESPONSE TO ITEM 1 OF NRC LETTER DATED JUNE 20, 1984

NRC Request for Additional Information

"1. Provide a detailed technical justification for your evaluation and shimming of closely-spaced rigid-to-rigid restraints and anchors. As part of this evaluation you should examine criteria used in the industry that are different from those used for Diablo Canyon. Your evaluation should include a justification of the criteria used for Diablo Canyon. In a similar manner, demonstrate the functionability of snubbers that were installed next to rigid supports. Demonstrate that the criteria used for Diablo Canyon will not provide excessive piping loads."

PGandE Response

The criteria used for evaluation and shimming of rigid restraints installed in close proximity to other rigid restraints and anchors, and evaluation of operability of snubbers located in close proximity to rigid restraints and anchors (License Condition 2.C.(11), Items 2 and 3) were discussed in detail with the NRC's technical audit team assigned to review these items on June 20 and 21, 1984.

As a result of this meeting, the Diablo Canyon Project criteria for review of rigid supports and snubbers in close proximity to other rigid supports and to anchors (equipment nozzles, penetrations, and pipe support anchors) were modified to provide additional conservatism as follows:

1. Snubbers and Rigids Next to Rigids

   Previously, snubbers located within three pipe diameters (3D) of a rigid support on piping 8 inches in diameter or greater were reviewed to assure that snubber lockup occurred or that pipe and support qualification was demonstrated with the snubber removed from the analysis. All other snubber-rigid and rigid-rigid support pairs on large bore piping were previously evaluated to a five pipe diameter (5D) proximity criterion.

   The criteria have been revised to extend the scope of review to all snubber-rigid pairs on large bore piping located within five pipe diameters of each other.

2. Snubbers and Rigids Next to Anchors

Previously, all snubbers and rigid supports on large bore piping within five pipe diameters of an anchor (or three diameters for snubbers on piping equal to or greater than 8 inches in diameter) were reviewed to assure that: (1) the snubber would actuate when required, or pipe and support qualification was demonstrated with the snubber removed from the analysis, and (2) the as-built gaps in the hot condition were 1/16-inch or less, or shimming was performed as required. For large bore piping, the scope of this consideration will be increased to address all snubbers and rigid restraints within ten pipe diameters (10D) of an anchor. For small bore piping (piping $\leq$ 2 inches in diameter), support effectiveness will be considered for all snubbers and rigid restraints located within 10D of an anchor (excluding decoupled branch connections).

The remainder of the criteria and methodology for these design considerations remains as described and justified in PGandE's Final Report on License Condition 2.C.(11), Items 2 and 3 submitted on June 1, 1984 (DCL-84-203). Table 1 summarizes these revised criteria.

PGandE's report on the License Condition Items 2 and 3 will be revised to incorporate these revised criteria and additional results are scheduled to be reported by July 3, 1984.

In discussions regarding these design considerations with the NRC audit team, it became apparent that certain criteria used by others in the nuclear industry, though not directly applicable to these specific considerations, could be applied to PGandE's snubber reduction program. These criteria allowed replacement of snubbers with a rigid restraint (strut) for those cases where the snubber is exposed to 1/16" thermal movement or less, or 1/8" or less provided the snubber is located outside a specified distance from an anchor or rigid support. These criteria will be reviewed to assure compatibility with Diablo Canyon licensing criteria and will be incorporated in the snubber reduction program for both small and large bore piping, described in PGandE's submittal dated May 16, 1984 (DCL-84-183).

TABLE 1

PROXIMITY CRITERIA FOR SUPPORT REVIEW

	LARGE BORE		SMALL BORE
Support Pair	8" $\leq$ D	8" > D > 2"	D $\leq$ 2"
Rigid-Rigid	5D	5D	N/A
Rigid-Anchor	10D	10D	10D
Snubber-Rigid	5D	5D	N/A
Snubber-Anchor	10D	10D	10D

1563d/0016K

ENCLOSURE 2

RESPONSE TO ITEM 2 OF NRC LETTER DATED JUNE 20, 1984

NRC Request for Additional Information

"2. With respect to the Independent Design Verification Program (IDVP), evaluate the IDVP's assessment of piping and support loads done by various internal and contract groups. In particular, focus on the rationale used by the IDVP for not taking a larger sample of piping problems although the IDVP identified deficiencies in a large portion of the sample."

PGandE Response

PGandE has requested that the IDVP respond to this request. The text of the IDVP response is presented below. PGandE is in agreement with the IDVP's assessment.

> "The IDVP believes that the conclusions of its independent verification of the Diablo Canyon plant design are adequately supported by both the methodology review and the sample of work reviewed, and that additional sample reviews are unnecessary considering the number, types, and significance of discrepancies discovered.
>
> In the review of small and large bore pipe supports, no generic issues or instances of violation of licensing criteria were found.
>
> In the review of small and large bore piping, no instances of violation of licensing criteria were discovered for work performed under the Corrective Action Program. Three generic issues were identified. These generic issues (SIFs, valves, vents and drains) were subsequently considered for all Unit 1 piping by the Diablo Canyon Project.
>
> The Interim Technical Reports for piping and supports were written to communciate the thoroughness of the design reviews. Generally, several items from each review were reported. Some of these items were differences in the DCP analyses that exceeded procedural tolerances. However, the majority involved valid use of clearly identified preliminary information and additional information provided to quantify analyst "judgment calls." Therefore, these items should not be considered errors and, in many cases, they should not be considered deficiencies.

The IDVP's conviction that its conclusions are fully supported on the basis of completed review work is based primarily on three general considerations:

- The methodology and criteria employed by the DCP were reviewed and found to meet and, in certain cases, exceed licensing requirements. In addition, all determinations made by the IDVP in both its initial work (independent calculations) and its later reviews (review of the DCP Corrective Action Program) were addressed and resolved by the DCP and reverified by the IDVP. The methodology of the verification program has rendered the probability of a safety significant remaining error extremely small, as is discussed subsequently.

- The piping and supports were very conservatively designed and constructed. In general, there is a significant design margin in all piping and supports due to this basic design approach.

- The IDVP conclusion in Section 6.2.5 of the IDVP Final Report is that Diablo Canyon meets the licensing requirements. This is not to say there may not be instances remaining where licensing criteria may not be fully met. If such instances exist, they will be of a local nature and will not be significant.

Methodology

The following are the major considerations in the development of the IDVP methodology and its review of the DCP methodology for the conduct of the overall design verification program:

- The IDVP reviewed the overall design criteria and design methodology.

- The IDVP reviewed and questioned in detail each aspect of a significant sample of the piping and pipe support design. This review was performed on individual analyses based upon extensive documented checklists. All items that were questioned were also documented, as were resolutions of these items. In addition, Teledyne engineers monitored this process, performed reviews of RLCA work, and participated in the assessment and resolution of many of the items.

- The DCP employed a uniform and homogeneous engineering approach to the qualification of the piping and supports. The DCP engineering program was extensively documented in procedures, instructions, and Design Criteria Memoranda. This documentation and its engineering content were separately reviewed by the IDVP.

- Due to several revisions of seismic spectra, thermal operating modes, and an early revision of methodology due to formation of the combined PGandE/Bechtel team that incorporated certain Bechtel technology, the piping and support calculations done by computer were initially completely redone and then subsequently revised several times during the design process. The initial analysis and all subsequent revisions required an analysis and review by at least two engineers. The revisions were also done for non-computer analyzed piping. The likelihood of a significant error escaping detection in this process is extremely small.

- The IDVP review of different revisions of the same calculations confirmed that the revision process, as implemented, was in fact effective in correcting discrepancies. It was repeatedly found that outdated inputs and minor mathematical and modeling errors were corrected in subsequent revisions of a given calculation. The discrepancies that were found in the DCP work were always small and were frequently determined to be valid "judgment calls." Typically, the DCP analyst would employ an approximation that the reviewer might question. In these cases, the differences were primarily in approximation techniques and were not sufficiently different to be unrepresentative of the actual conditions being modeled.

- The pipe support designs were originally based upon a uniform and homogeneous methodology, as compared to other aspects of the plant design such as equipment and structures. This led to a consistency of analysis methods and reduced the opportunity for error. In cases where supports were more complex than the typical standard, they were all treated with extra care as special cases and this was confirmed by the IDVP.

- The significance of this homogeneity to the IDVP is that relatively few piping systems and supports are representative of the entire class, and ensures that correction of the generic issues (which was done) serves to upgrade the entire category. Thus, the examination of additional samples beyond those chosen by the IDVP (discussed subsequently) would reveal no new knowledge.

Basic Conservatism in Piping Design

The second reason for the IDVP conviction that their conclusions remain valid is related to the basic conservatism of the design, particularly in the area of pipe supports. The typical support is constructed of standard structural members. It is a relatively rare case that applied stresses approach the allowable stresses. A

major contributing factor is the requirement to design the pipe supports to have a minimum natural frequency. In other words, the designs were controlled by flexibility rather than strength considerations and as a result there is generally a surplus of structural strength.

The net result is that minor discrepancies (which may still exist) can be readily accommodated within the framework of the conservatism of the design, in all probability within the licensing criteria and, certainly without causing a safety problem.

Significance

The myriad of individual load carrying hardware items (bolts, clips, beams, nuts, etc.) make it imprudent to conclude that there are no instances of overstress in the plant. However, the IDVP is confident, based on their in-depth review of the plant design and design methodology, that there will be no instances of overstress that will have significant consequences. This conclusion is based in part on the structural redundancy inherent in the design, and the fact that localized overstress conditions will result in load redistribution to adjacent structural members such that gross failures would not occur.

Additional Commentary

Throughout the various phases of the independent design review, the IDVP has been acutely aware of its responsiblity to determine and address any and all issues, design practices, or actual designs that would violate the licensing criteria or compromise the health and safety of the public in any way. With this in mind, the IDVP often expanded its sampling in order to fully address all significant issues.

One example of IDVP sample expansion in the earlier independent analysis phase of the program involved the large bore piping analysis sample which was expanded by 50% (i.e., between ITRs 12 and 17). The application of the IDVPs sample expansion continued through the DCPs corrective action program (CAP). Based on the IDVP findings and concerns (both generic and specific) in the CAP, the IDVP expanded its sample by approximately 45% in the areas of large and small bore piping and supports. These expanded samples were thoroughly reviewed to ensure the final resolution of all technical issues as well as to verify the DCP use of current design input data.

It is clear that the IDVP, in fact, often relied on the expanded sample to assure complete resolution of all issues identified by the IDVP.

In light of the above discussion, it is worthwhile to mention the NRC inspection at the IDVP offices in Berkeley, California, on June 21, 1984. Prior to the inspection, the NRC Staff reviewed the IDVP Interim Technical Reports on piping and supports and noted the discrepancies identified therein. During the meeting, these individual discrepancies were examined in detail as well as substantial quantities of work upon which the Interim Technical Reports are based. We believe that in all cases the documentation provided and subsequent discussions would allow the NRC to understand and concur with the IDVP conclusions.

It is further noted that, in addition to the continuous overview and comment provided by Teledyne engineers, the NRC Staff conducted several reviews of RLCA work at the Berkeley offices. These reviews produced no significant questions or programmatic changes."

ENCLOSURE 3

RESPONSE TO ITEM 3 OF NRC LETTER DATED JUNE 20, 1984

NRC Request for Additional Information

"3. Provide those measures that are currently in place or are to be instituted on current and future work activities performed by any and all onsite engineering groups in the following areas:

a. personnel indoctrination and training to assure effective implementation of all QA and technical program requirements;

b. upgrading of site procedures and avoidance of use of unauthorized documents to perform work functions;

c. upgrade of the procedural control of preliminary design data and design interfaces between onsite groups and offsite groups;

d. improvement in the timeliness of project responses to site personnel safety concerns and QA audit findings;

e. plans for the conduct of QA program audits that will ensure that all aspects of design control requirements are implemented in accordance with program provisions and ensure that the audit results are thoroughly evaluated prior to accepting any corrective actions;

f. modification of tolerance clarification program implementation to assure that adequate design reviews are made prior to major hardware modifications."

PGandE Response

The Onsite Project Engineering Group (OPEG), which is the multidiscipline engineering organization located at the jobsite, is an extension of the Project engineering organization in San Francisco. As is typical of resident engineering groups at most nuclear power plant construction sites, OPEG includes representation from the various Project discipline groups, operates in accordance with the Project engineering procedures, and has the basic function of facilitating onsite resolution of engineering problems for construction, startup, and operations. OPEG was established primarily (1) to facilitate coordination between Construction and Design Engineering, (2) to provide more direct feedback to design engineering on construction, startup, and operations matters, and (3) to perform certain design engineering activities (e.g., small bore piping design) that were believed best performed in proximity to the physical plant.

Coincident with the completion of essentially all Unit 1 engineering activities, a decision was made on June 14, 1984, to no longer perform final safety-related design engineering work in OPEG. All such remaining activities are now being performed by the Project engineering organization in San Francisco for both Unit 1 and Unit 2. Certain support engineering activities, including those associated with safety-related installations, involving tasks such as field walkdowns, construction feasibility checks, and interfacing to clarify construction and startup problem definitions will continue to be performed by OPEG personnel. Project Engineer's Instruction (PEI) No. 9, which defines the scope and responsibilities of the OPEG organization, is currently being revised to clearly define these changes to OPEG's engineering scope and authority.

The following sections address the specific NRC requests for additional information concerning procedures and practices governing current and future work activities at OPEG.

a. Indoctrination and Training

The current personnel indoctrination and training program was discussed in PGandE letter DCL-84-131, dated April 4, 1984, as follows:

> "The current training program consists of a four hour orientation to the Engineering Procedures Manual and an indoctrination in Quality Assurance. The trainee is advised of the contents of the Manual, its arrangement, and the subjects covered by individual procedures. The various forms used in the design process, such as calculation cover sheets, Engineering Material Memoranda, Discrepancy Reports, are presented in the context of the applicable procedure. The content of the current training program is substantially the same as that which was in place since the inception of the Project."

The Project commitment to training program improvements to better administer and document training at OPEG was also discussed in PGandE letter DCL-84-046, dated February 7, 1984, to the NRC:

> "In order to better implement Project training requirements, the Project proposes the following new actions for OPEG:
>
> 1. Training records of all engineering personnel working on the Project have been reviewed. Effective immediately, any person who currently does not have the required training in QA and engineering procedures will not be allowed to continue engineering design work until such training is completed.
>
> 2. Weekly training sessions in QA/Engineering procedures will begin immediately to train new arrivals. Also, a refresher course will be held three times a year for all engineering personnel who complete or who have completed QA/Engineering procedures.

3. No person newly assigned to OPEG will be permitted to perform, check, or approve any calculation until the QA/Engineering procedure training has been completed.

4. Failure to complete a refresher course within 30 days of requirement will disqualify an engineer from performing, checking, or approving any calculation.

5. All training personnel will utilize a formal syllabus which shall be reviewed and approved by Engineering and QA management. Initially, the training sessions shall be monitored by Engineering and QA management to assure that required matters are properly addressed. Training sessions will give special attention to changes in procedures that have been implemented in the last year.

6. All such training requirements will be formalized and documented, and compliance will be verified by QA audits."

These actions have been implemented.

b. Improvements to Procedures

The improvements that have been made to avoid use of unauthorized documents to perform work functions were described in PGandE letter DCL-84-046, dated February 7, 1984, as follows:

"1. Document Control Procedures and practices are being reviewed with onsite Engineering personnel. They have been notified of the importance of complying with document control procedures and of their responsibility to update manuals and return acknowledgement forms.

2. Procedure P-1 was revised in Rev. 4 dated January 30, 1984 to require a monthly supervisory review of controlled manuals to assure that procedures, instructions and criteria are kept current.

3. For future revisions to design procedures, the supervisor will discuss the content of the revision with engineers under his supervision to be sure everyone is aware of changes and how they are to be implemented. Alternatively, procedure changes which are now routed to all manual holders will be formally routed to all engineers and will require an acknowledgement signature."

And further:

"Project Engineering Procedures (EMP-3.3) provide for the use of references such as textbooks, catalogs, monographs and other such accepted industry techniques in specific calculations. The reference must be documented when necessary to provide details of the design sufficient to allow independent review.

In such cases, it is required that they be documented as formal references with the calculation in which they are used. Their use then is checked and approved via the calculation review and approval process. In the future, approvals of this material will be provided where general project standardization in their use is applicable. These materials will be formalized, controlled, and included in procedures manuals with appropriate instructions, qualifications and limitations."

These actions have been implemented.

c. Procedural Control of Interfaces

DCP procedures require the control of preliminary design data. One aspect concerns preparation of calculations that use preliminary design data or assumptions requiring later verification. All such calculations are required to be classified and identified as "Preliminary". Piping calculation packages identify the items requiring verification at a later design stage. When all such items have been verified, a formal revision to the calculation is made to designate the calculation as "Final". Reviews are performed to assure that all calculations reach "Final" status to assure that any preliminary information in the calculation has been properly finalized. Procedures also require that calculation logs include the status (i.e., preliminary or final) of each calculation to provide improved control.

This process was supplemented by the institution of additional procedural controls over the use of preliminary seismic input assumptions for small bore piping design. This matter was previously addressed in PGandE's response dated March 6, 1984, (DQA) to Joint Intervenor's Motion of February 14, 1984, as follows:

"167 Design of small bore piping relies upon seismic spectra inputs from DCMs C17, C28, and C30 developed by the Civil discipline and seismic anchor movements (SAM) of large bore piping to which the small bore piping connects. It is normally desirable to delay the analysis of small bore piping until all such inputs are finalized. However, the Project recognized that some schedule advantages could be gained by beginning with preliminary seismic input assumptions for the analysis of small bore piping, with final analysis being completed as final seismic input became available.

The use of this initial preliminary input data is not of concern since subsequent finalization of the calculation would have corrected any differences in the input information. The process of ensuring that the latest seismic input was used in calculations was controlled by Piping Procedure P-27. This procedure required documented review of all calculations affected by C-17, C-28, and C-30, to perform new analyses where required, and to respond, in writing, when all actions were complete. While it was recognized that response spectra and

structural movements were undergoing a complete review, controlled copies at the seismic input criteria were assigned to OPEG in early 1983. As C-17, C-28, and C-30 were finalized, the reviews required by piping procedure P-27 were performed thus assuring that all final input information was included in the calculations." (DQA Response, Breismeister et al. Affidavit at 66, 67)

A second aspect of controlling preliminary design data concerns information originally provided by telephone. DCP procedures require such information to be confirmed in writing and controlled as discussed in previous PGandE submittals as follows:.

"Engineering Manual Procedure (EMP) 6.1, Section 4.4, specifically provides that all design information provided verbally must be confirmed in writing. If the data are used prior to such confirmation, the calculations must be marked "preliminary" and cannot be finally approved without such confirmation. This requirement is an additional measure to assure that preliminary data are confirmed before the calculations are reviewed for final approval." (PGandE letter DCL-84-131, dated April 4, 1984, at page 57)

"212 It is possible that, during certain periods, onsite personnel may have had a delay in obtaining information from San Francisco. To minimize this inefficiency, onsite engineering personnel were temporarily relocated to the home office in order to provide data to onsite engineers. This information was transmitted in some cases by phone in order to expedite the performance of preliminary calculations. Engineering Manual Procedure 6.1, Section 4.4 specifically stated that all design information provided verbally must be confirmed in writing. Engineering Manual Procedure 3.3, Section 4.1.2 provides that data requiring verification at a later design stage be identified and the calculation cover sheet marked "Preliminary" until verified. This was the procedure used for such circumstances throughout the reverification program. While this practice is allowed, it was not commonly used except for brief periods or special cases. In all cases, data was subsequently provided by normal document control procedures and verified prior to finalizing affected calculations." (DQA Response, Breismeister et al. Affidavit at page 82)

Project QA audits have specifically reviewed implementation of these controls, and will continue to emphasize this area.

The second part of the Staff's question involves procedural control of design interfaces between onsite groups and offsite groups. The interfaces between OPEG and the home office Project engineering organization are procedurally defined.

The basic interface between these groups was discussed in PGandE letter DCL-84-046, dated February 7, 1984, at page 36 as follows:

"OPEG is an extension of the home office project engineering organization which is located in a different geographical area. This relationship is defined in the DCP Nuclear Quality Assurance Manual (NQAM) Section I No. 7. As part of the

project engineering team, OPEG carries out the Engineering Department's responsibilities outlined in NQAM Section I No. 7, as directed by the Project Engineer to whom OPEG reports (Reference NQAM Section I No. I, Figure 7).

The specific duties, responsibilities, and authority of OPEG at the Diablo Canyon jobsite are delineated in procedure PEI No. 9, Rev. 0. The accomplishment of these duties and responsibilities is delegated through the Engineer to lead discipline engineers, then to the discipline group engineers. Assignment of these duties and responsibilities is made by the OPE/AOPE and lead discipline engineers. The organizational chain within OPEG is defined both in PEI No. 9 and in a written organization chart maintained by the Onsite Project Engineer.

The authority and duties of personnel shown on the established organization chart are delineated in writing as follows:

a. Onsite Project Engineer/Onsite Assistant Project Engineer responsibilities and authorities are defined in PEI No. 9, Paragraphs 3.3 and 3.4. Signature authority of the OPE/OAPE is defined in PEI No. 9, paragraph 4.3, and responsibility for approval of design changes initiated by OPEG is defined in PEI No. 9, paragraph 4.2.4. Additional duties are defined in other procedures applicable to design of piping and piping supports, consisting of Engineering Manual procedures; Piping Group Controlled Procedures, Instructions and Criteria; and Project Engineer's Instruction (Reference PEI No. 9, Paragraph 4.2.1)."

Piping group procedures provide details of design interfaces between OPEG and home office engineering covering such areas as communication of revised seismic response spectra, changes in piping movements, and changes in loads on pipe supports.

As previously noted, the interfaces between OPEG and home office engineering are being substantially modified to reflect OPEG's reduced scope of activity. These changes will be documented in a revision to PEI-9.

d. Timeliness of PGandE Responses

PGandE and the Diablo Canyon Project organization have taken actions to facilitate the expression of safety concerns by site personnel and to provide for a timely response to such concerns when received. The primary action has been the establishment of a "Quality Hotline" (See DQA Response, Shiffer et al. Affidavit, Exhibit 11) at the Diablo Canyon Plant. The "Quality Hotline" allows site personnel to freely express concerns (anonymously if desired) and provide a method for timely feedback on resolution of these matters to the concerned individual.

DCP QA procedures also provide methods for on-site engineering personnel to bring to management attention design issues which they believe could

potentially affect the safe design, construction, or operation of the Diablo Canyon Power Plant. These methods were previously discussed in the DQA Response, Breismeister et al. Affidavit at page 36 as follows:

"84. Diablo Canyon Project written procedures stress bringing potential problems to the attention of engineering supervision in a timely manner so that appropriate steps can be taken to identify and implement any corrective action necessary to resolve the concern and prevent future recurrence.

85. Engineering Manual Procedures covering Discrepancy Reports (Procedure 10.1, paragraph 3.1) and Nonconformance Reports (Procedure 9.1, paragraph 4.1.1) both specifically state that anyone who believes he has identified a potential engineering discrepancy or nonconformance should bring the matter to the attention of the appropriate Engineering Department group leader or supervisor for resolution.

86. These clearly written project procedures do not restrain or prevent engineers from discussing potential problems with representatives of quality control or the NRC. These procedures recognize that many concerns raised by engineers are of a nature that may easily be resolved by the supervisor who possesses a broader knowledge of the project. If needed, the supervisor may involve staff specialists or engineers from other disciplines to assist. In no event does management discourage engineers, or any other person, from raising legitimate concerns. (See Exhibit 1, dated March 22, 1982, and referencing previous policy statements dating back to the 1970s.)

87. Quality Assurance and Quality Engineering personnel have been physically located within OPEG and have been available at any time to discuss and assist with the resolution of quality problems. Training sessions were held in support of the written procedures. The training sessions on the Engineering Manual procedures, which are mandatory for engineering personnel, specifically include a description of Discrepancy Reports and Nonconformance Reports."

And further:

"89. Additionally, the Bechtel Power Corporation, San Francisco Power Division Instruction 3-17, "10 CFR Part 21, Reporting of Defects and Noncompliances," applies to and is implemented by the Diablo Canyon Project. This instruction defines responsibilities, establishes requirements, and provides guidance for actions necessary to meet the reporting requirements of 10 CFR 21. Procedural requirements to initiate evaluation and reporting pursuant to 10 CFR 21 are also contained in this instruction. The instruction is posted in Diablo Canyon Project work areas for reference. Also, PGandE has posted 10 CFR 19 reporting

instructions and a copy of Form NRC-3 which gives guidance for contacting the NRC and the regional NRC phone numbers and addresses. These documents have been posted in all PGandE facilities (i.e., PGandE headquarters, construction offices, and operating facilities as well as in the OPEG offices."

Once concerns have been identified on a Discrepancy Report or Nonconformance Report, DCP procedures require that they be resolved promptly. Engineering Manual Procedure 10.1, paragraph 3.4.1 requires (for Discrepancy Reports):

"3.4.1 The engineer/supervisor shall investigate the discrepancy and:

a) provide for a prompt resolution of the specific discrepancy

b) identify the cause, if possible and

c) take steps to prevent recurrence, if necessary."

The timely progress of resolution of Discrepancy Reports is monitored by both Quality Engineering and Project Quality Assurance. Any overdue Discrepancy Reports are identified on the "Delinquent Open Item Report" which is provided to Project Management on a monthly basis. Management has strongly emphasized timely response to such open items.

Similarly, Engineering Manual Procedure 9.1 concerning Nonconformance Reports (NCRs) require that any engineering problems reported as a potential nonconformance to the Engineering Group Leader or Group Supervisor be evaluated within three working days to confirm that a Nonconformance Report should be issued. Timely resolution of NCRs is tracked on a monthly status report, as well as a "Quality Problem Report Status Report" issued as frequently as weekly to PGandE and DCP Management.

Timely response to audit findings is also being stressed. Any overdue responses are identified on the "Delinquent Open Item Report" for management attention. Additional measures taken for DCP audits are described in PGandE letter DCL-84-131, dated April 4, 1984, at page 16 as follows:

"Project QA has re-emphasized to Engineering the need for timely response to audit findings, and is placing additional emphasis on aggressive follow-up. To add further management controls, Project Quality Assurance recently implemented, and has issued on a weekly basis, a "QA Open Items Summary." This report provides the status of each open Quality Audit Finding, including the scheduled dates for QAF response, approval, and closure, and is distributed to appropriate project management."

Actions taken to improve responsiveness to PGandE audit findings were described in PGandE letter DCL-84-131, dated April 4, 1984, as follows:

"The NRC Inspector identified three findings from PGandE audits 20703, 20813, and 20917 as having untimely responses without documented justification for the delays. There have been some PGandE QA audit findings for which timely responses were not submitted. For some of these delayed responses, verbal

extensions were requested and granted. When PGandE management became aware of this problem with audit responses in November 1982, Nonconformance Report (NCR) DCO-82-QA-N005 was issued. The NCR was addressed to the QA Department rather than to the audited organization because QA sets the policy on responses time to audit findings. Part of the corrective action for this NCR was a revision to QA procedures to redefine audit response requirements, including a provision to ensure that justified delays to responses are authorized in writing. Since all audit findings are now prioritized and appropriately resolved prior to significant changes in plant operating status, there is no impact of these observations for low power testing or commercial power operation."

e. QA Audits

Planning and rescheduling of PGandE program audits are systematically controlled to ensure that all QA program elements will be covered by program audits. These measures were described in PGandE letter DCL-84-131, dated April 4, 1984, at page 77 as follows:

"The PGandE program includes two types of audits. The first type are Program Audits. Program audits provide coverage of all QA Program elements as required by Regulatory Guide 1.33 and 1.144. A Program audit is a documented activity performed to verify by examination and evaluation of objective evidence that the company's, or supplier's QA program has been developed, documented, and effectively implemented. The second type is the Activity audit. Activity Audits are equivalent to the activities which some utilities refer to as surveillance or monitoring. PGandE documents the activity as an audit and evalautes any findings as audit findings. Activity audits provide additional monitoring of specific activites and are supplementary to the Program audits. An Activity audit is a documented activity performed to verify that a specific task conforms to the applicable requirements of the company's or a contractor's/supplier's QA Program.

Program audits are scheduled in accordance with a procedure for specific areas of the QA Program over a 2-year period or more frequent in accordance with regulations. Activity audits are scheduled whenever desired to cover scheduled work activities. When a Program audit cannot be performed due to a lack of activity in the areas to be audited it must be rescheduled in order to meet our regulatory commitments."

DCP Project audits are also planned in advance to ensure that all aspects of design control are implemented. A Master Audit Plan is prepared to identify all required audit areas, the corresponding audit scopes and the basic control documents defining quality requirements for each audit area. A schedule is developed identifying those audit areas which are to be audited during each quarter, including the schedule for at least a year in advance. This planning is used to provide full coverage of Project activities on a schedule that is consistent with the Project schedule for the activities being audited. Relative to OPEG, this audit program has included all the major areas of design activity such as control of calculations, control of design drawings,

indoctrination and training, and design change control. Project Audits are supplemented by Project QA monitoring activities (documented quality reviews similar to audits) and by Management Audits performed by Bechtel San Francisco Power Division Quality Assurance.

Project QA audit and monitoring acitivites at OPEG were substantially increased during 1984 as part of the Project's continuing effort to assure that all aspects of design control are implemented at OPEG.

The second part of Item (e) concerns the thorough evaluation of audit results prior to acceptance of corrective actions. Methods for evaluating responses to PGandE audits were described in PGandE letter DCL-84-131, dated April 4, 1984, at page 8 as follows:

> "All PGandE audit findings are documented on Open Item Reports (OIRs) or NCRs, and the corrective actions to those findings are evaluated by PGandE QA supervisors for identification of causes, preventive measures taken, and possible generic implications. When an audit finding is documented on an NCR, the review for generic implications is documented on the form under Corrective Action. Every NCR is investigated by a specially appointed Technical Review Group (TRG) whose responsibility, in part, is to evaluate and document the cause, resolution, and corrective actions required to prevent recurrence for each deficiency. Part of determining the "corrective actions to prevent recurrence" is the TRG's investigation into the generic implications of the deficiency.
>
> For audit findings considered not "significant" (as indicated in 10 CFR 50, Appendix B, Criterion XVI), they are not identified in an NCR nor were these issues documented on the audit finding form. However, the evaluation for generic implications does take place and was a basic part of the review of all audit findings. A recent revision to QA procedures requires the audited organization to document their investigation into each finding to determine the cause, the measures to prevent recurrence, and the generic implications."

Responses to Project audit findings are also evaluated for acceptability prior to closure. Project QA reviews the response to assure that the recommended remedial, investigative, and corrective actions (or acceptable alternates) have been performed. Satisfactory implementation of these actions is verified by Project QA, and justification for closure is documented on the Quality Audit Finding form. The Project Quality Assurance Engineer reviews the closure actions taken and reissues the Audit Report when he is in agreement that all findings have been satisfactorily closed. If audit findings are considered "significant", they are documented on an NCR and evaluated in the same way as described in the preceding paragraph.

As indicated in PGandE letter DCL-84-131, dated April, 1984, at pages 16 and 18, DCP audit findings related to OPEG were not closed prior to corrective action taking place.

f. Modification of Tolerance Clarification Program

A discussion of modifications to the Project procedures to assure that adequate reviews are made prior to major hardware modifications was presented in PGandE letter DCL-84-203, dated June 1, 1984, as follows:

"In order to eliminate potential concerns with the PSDTC program, the following steps are being taken:

1. The PSDTC program, as defined in Project Engineer's Instruction 12, is being discontinued effective June 8, 1984. Any future Unit 1 pipe support design changes will be effected by the Design Change Notice process of the Engineering Manual Procedure 3.60N.

2. In order to facilitate field resolution of pipe support related construction problems on Unit 2 in the future, a new Field Change Request (FCR) procedure is being instituted under Project Engineer's Instruction 19. The FCR procedure will apply to all deviations proposed by Construction from pipe support designs issued by Engineering where the proposed deviations are beyond approved installation tolerances or existing delegation of design responsibility. Construction will initiate requests for such deviation on an FCR form and submit them to Engineering for review and approval. The engineering approval of the FCR will include justification for acceptance and will document any required coordination which has occurred with other discipline groups to determine acceptance. Where a calculation is required to verify the adequacy of the proposed change, the calculation will be completed in accordance with Engineering Manual Procedure 3.3 prior to approval of the FCR. The engineering approval of an FCR will be indicated by the signature of the responsible engineer, the group supervisor, and the Project Engineer.

   In the case of deviations proposed by Construction which do not alter the functional design characteristics of the pipe support or which are minor design drawing clarifications, General Construction Lead Discipline Engineers can authorize in-process work to continue on an "at-risk" basis for up to five days while Engineering approval of the FCR is being obtained. The authorization will be in writing and will be included in the pipe support work package before the work can proceed. This in-process change authority will expire and work so authorized will cease if Engineering approval is not received in five days.

3. For all pipe support modifications for Unit 1 or Unit 2, the pipe support as-built drawings will continue to include any modifications authorized by a previous PSDTC or an FCR such that no deviations will exist between the as-built drawing and any modifications authorized in the field. The final engineering acceptance of the installed condition will continue to be the final engineering review, checking, and approval of the as-built pipe support drawing."