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ZIMMERMAN,R. Region 5, Ofc of the Director
RECIP.NAME RECIPIENT AFFILIATION
SHIFFER,J.D. Pacific Gas & Electric Co.

SUBJECT: Ack receipt of 890420 ltr re steps taken to correct violations noted in Insp Repts 50-275/89-01 & 50-323/89-01.

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Docket Nos. 50-275 and 50-323

Pacific Gas and Electric Company
77 Beale Street, Room 1451
San Francisco, California 94106

Attention: Mr. J. D. Shiffer, Vice President
Nuclear Power Generation

Gentlemen:

Thank you for your letter of April 20, 1989, in response to our Notice of Violation and Inspection Report Nos. 50-275/89-01 and 50-323/89-01, dated March 21, 1989, informing us of the steps you have taken to correct the items which we brought to your attention. Your corrective actions will be verified during a future inspection.

Your cooperation with us is appreciated.

Sincerely,

R. Zimmerman, Acting Director
Division of Reactor Safety
and Projects

bcc w/copy of letter dated 4/20/89:
Docket File
Resident Inspector
Project Inspector
G. Cook
A. Johnson
B. Faulkenberry
J. Martin
LFMB
State of California

REGION V

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Pacific Gas and Electric Company

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James D. Shiffer
Vice President
Nuclear Power Generation

April 20, 1989

PG&E Letter No. DCL-89-100

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Reply to NRC Inspection Report 50-275/89-01 and 50-323/89-01

Gentlemen:

On March 21, 1989, NRC Inspection Report Nos. 50-275/89-01 and 50-323/89-01 (Inspection Report) was issued, which identified three areas of generic weakness regarding understanding of the plant design bases, engineering/plant interface, and engineering work. PG&E has reviewed these identified areas and taken actions as described in Enclosure 1. The description and status of PG&E's enhancements to the Configuration Management Program, identified as part of the corrective action in Enclosure 1, is provided in PG&E Letter DCL-89-099.

The Inspection Report also contained a Notice of Violation citing nine Severity Level IV Violations and one Notice of Deviation which were identified during an NRC Special Inspection at the Diablo Canyon Power Plant (DCPP), Units 1 and 2. Several of these violations were associated with the GE/GW area ventilation ducting modification which was installed during the DCPP Unit 2 second refueling outage. Our review indicates that these GE/GW area violations have the same specific cause. Accordingly, the responses to these violations are found in Enclosure 2. PG&E's responses to the remaining violations and the deviation are provided in Enclosures 3 and 4, respectively.

The letter forwarding the Inspection Report also requested that PG&E provide a written response addressing NRC observations characterizing PG&E's Safety System Functional Audit and Review (SSFAR) and Safety System Outage Modification Inspections (SSOMI). PG&E's responses to these comments are included as Enclosure 5.

In our view, these violations when viewed individually do not pose an operational concern, but indicate a need for improvement in certain specific areas. PG&E senior management is focusing

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considerable attention on these issues to assure that Diablo Canyon's high level of performance is maintained.

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

Sincerely,

J. D. Shiffer

cc: J. B. Martin
M. M. Mendonca
P. P. Narbut
H. Rood
B. H. Vogler
CPUC
Diablo Distribution

Enclosures

2617S/0068K/DWO/2237

ENCLOSURE 1

RESPONSES TO THREE AREAS OF NRC IDENTIFIED WEAKNESS
IN INSPECTION REPORT NOS. 50-275/89-01 and 50-323/89-01

In the subject Inspection Report, the NRC identified three areas of generic weakness. Two of these areas regarding the plant staff's understanding of the design bases and the interface between engineering and plant personnel are similar to those previously identified by the NRC in its Maintenance Team Inspection. Since the Maintenance Team Inspection, PG&E has devoted substantial resources to address these two areas of concern. Actions taken include: (1) implementation of the plant System Engineer Program as an integral part of the plant staff; (2) the involvement of Nuclear Engineering and Construction Services (NECS) System Design Engineers in plant operations through activities such as joint quarterly system reviews; (3) the enhancement of the Configuration Management Program (CMP); and (4) the reinforcement of management expectations to all plant personnel regarding engineering involvement in plant activities. Progress has also been made to strengthen the working relationships and interface between NECS System Design Engineers and the plant staff. A key element in achieving this progress is the emphasis on coordination of design and operations activities between the plant System Engineers and the System Design Engineers. Considerable progress has also been made in the projects involved in clarifying the design bases and making them more accessible to the plant staff.

A third NRC generic concern centers on certain incomplete or inadequate engineering work. PG&E agrees that such instances have occurred, but believes that they have been either isolated cases due to personnel error or involve areas in which more thorough documentation would enhance engineering product quality. Nonetheless, to assure and maintain the quality of engineering work, PG&E is retraining people in this area, strengthening its engineering procedures, and performing further reviews of selected previous work.

The following is a summary of the actions being taken by PG&E to address identified weaknesses.

I. NRC Comment Nos. 1 and 2

"Plant Staff Does Not Fully Understand the Plant Design Basis

...[and]...

The Interface Between Engineering and the Plant is Weak"

PG&E Response:

PG&E Letter DCL-88-236, dated October 5, 1988, responded to similar concerns which had been identified in the NRC Maintenance Team Inspection (50-275/88-15 and 50-323/88-14) and stated that PG&E had implemented and strengthened programs to address these NRC concerns. These programs included the establishment of an enhanced CMP, the implementation of the System Engineer Program at DCPP, and the increased involvement in plant operations activities of System Design Engineers within the General Office NECS organization. Since initiation, PG&E has devoted substantial resources to these efforts to assure successful implementation. A summary of the CMP, the System Engineer Program, and the actions to increase NECS System Design Engineer involvement in plant operations follow.

Configuration Management Program

A major effort is underway to improve plant knowledge of the DCPP design bases by enhancing Design Criteria Memoranda (DCM) and making them available to the plant staff. Additionally, the CMP includes a one-time review of surveillance test procedures (STPs) and selected maintenance procedures to assure that current maintenance and surveillance testing activities are consistent with the design bases. These CMP activities will enhance the interface between the plant staff and design/engineering personnel, and improve the plant staff's understanding of the design bases.

The CMP was implemented to provide programmatic improvements to PG&E's existing configuration management program, and represents a substantial effort to facilitate the understanding and effective use of the design bases. The CMP tasks that have been completed to date are listed below:

1. Nuclear Power Generation (NPG) Policy Statement 1.24, "NPG Configuration Management Policy," was issued on December 29, 1988.

2. Nuclear Plant Administrative Procedure (NPAP) C-1/NPG 4.2, "Nuclear Power Plant Modification Program," has been revised to implement the Configuration Management Policy and to provide clear interfaces with NECS.

3. Nuclear Engineering Manual Procedure (NEMP) 3.6 ON, "Operating Nuclear Power Plant Design Changes," has been revised to require new or modified design bases to be included in the associated Design Change Notice (DCN).

4. NEMP 3.6 ON has been revised to require test and acceptance criteria to be included in the DCN process.

5. A DCM Writers Guide (NEMP 3.2, "Design Criteria Memorandum") has been prepared and is in use.

6. The Design Basis Document Source Reference Guide (DBDSRG) has been issued and training of plant System Engineers has been provided and will continue.

7. Drafts of three pilot DCMs were completed.

8. Surveillance procedures associated with the pilot DCMs were reviewed.

9. A System/Design Engineer Matrix has been established which (among other things) assigns specific individuals responsibility for specific systems and topical design areas.

The progress and status of the CMP were provided to NRC Region V at a meeting on March 3, 1989, and is documented in PG&E Letter DCL-89-099. On March 3, 1989, the NRC reviewed the draft of the revised DCM Writers Guide, the DBDSRG, the System Engineer/System Design Engineer Matrix, a draft copy of a DCM for the auxiliary feedwater system, four Instructor Lesson Guides for design basis training, and the revised copy of NEMP 3.6 ON.

System Engineer Program and Greater Involvement of System Design Engineers

The System Engineer Program at DCPP and the System Design Engineer Program at the General Office also establish dedicated plant and design engineering staff to support the plant System Engineer Program. The activities of the System and Design Engineers are summarized in Table 1. Full implementation of the program is scheduled for December, 1989.

To maintain close working relationships with NECS, System Engineer Procedure Administrative Procedure (AP) A-350, "System Engineering Program," requires joint participation by the plant System Engineer and System Design Engineer in quarterly system walkdowns and preparation of system status reports to be submitted to plant management. To facilitate interface coordination, a System Engineer/System Design Engineer matrix listing has been developed that provides detailed information as to system and topical design area personnel assignments (e.g., high energy line break, fire protection, equipment qualification, seismic, etc.), group leaders, departments, and telephone contacts.

Progress of System Engineer Program

The System Engineer Program involved a reorganization of plant engineering resources such that an engineer was assigned to each major plant system. The

organizational structure is intended to better focus attention on system problems, and to assure that system design bases are well understood by the plant staff. The program is structured to provide improved communication and coordination between the plant organizations and engineering and support organizations at the General Office.

Major accomplishments of the System Engineer Program to date are as follows:

1. AP A-350, which formalizes the program and establishes duties and responsibilities, has been issued.

2. Staffing has been completed.

3. Fifteen System Engineers have completed Technical Staff training.

4. The first of three design basis training sessions for System Engineers has been completed to provide training in the use of the DBDSRG and major safety-related topical design areas.

5. System quarterly walkdowns and system quarterly status reports have been completed.

6. NECS personnel have been assigned from the functional engineering disciplines to each of the designated plant systems. These assignments are documented in the System Engineer/System Design Engineer matrix listing.

Short-Term Specific Actions

In addition to the above major long-term programs, PG&E is taking or has taken the following short-term actions:

A. Due to an incident (see LER 1-84-040-00, PG&E Letter DCL-89-078, dated March 24, 1989) involving a failure to incorporate a design requirement which was transmitted by correspondence to the plant, PG&E has reviewed more than 3000 correspondence records and plant operating procedures to ensure that engineering correspondence and communications specific to restrictions on plant operations have been appropriately incorporated into plant procedures. With five exceptions, engineering recommendations were incorporated into plant procedures. Of the 3000 items reviewed, the small number and nature of the exception items identified do not create a significant concern regarding the safe operation of the plant.

B. A general review of the FSAR and the NRC Safety Evaluation Reports for Diablo Canyon is being performed by System and System Design Engineers to confirm that the design bases summarized in the FSAR Update are appropriately implemented in plant procedures. This review will be completed by June 30, 1989. A more detailed review of design bases will be performed during the development of DCMs as part of the CMP.

C. NEMP 3.6 ON will be revised to specify that Engineering-identified constraints on operations will be appropriately communicated to the plant through the design change process.

D. The Position Plan for the Manager of NECS, as well as applicable NPG Policy Statements (e.g. NPG Policy 1.3, "Plant Operation"), are being revised to more clearly define Design Engineering's role in plant operations. In particular, Engineering's responsibilities are to:

- Maintain conformance of system performance and effect design improvements that will enhance safety and reliability
- Assure the plant staff is provided with comprehensive information on the plant's design bases
- Provide Engineering support to the plant staff in such areas as material procurement, specification of testing requirements, and analysis of system problems.

II. NRC Comment No. 3:

"Engineering Work Has Been Incomplete or Inadequate"

PG&E Response

Certain deficiencies have been found in the engineering work by both PG&E and the NRC. The specific findings identified in the Inspection Report used by the NRC to reach its generic concern are provided below with PG&E's review of these findings.

A review of the identified findings indicated two isolated occurrences of individual failure to follow established procedures, and one case of failure to review all calculations impacted by a design change. The NRC findings also included a number of examples where improved documentation of judgments, inputs, and their associated bases would be appropriate to strengthen the design/analysis process and provide a very high level of confidence in engineering adequacy and completeness. Enhancements to the CMP, and the specific actions discussed in response to the NOVs and other findings as noted in the Inspection Report, will strengthen PG&E's existing program and provide improved documentation of the process.

Short-Term Specific Actions

PG&E is taking the following specific actions to improve the performance of engineering reviews and calculations:

A. A training update for Engineering Group Supervisors and Group Leaders will be conducted to stress the importance of identifying affected calculations and identifying substantive factors that are outside the obvious impact of a design change. This training will be completed by May 31, 1989.

B. A review of safety-related Design Change Packages (DCPs) from the recent Unit 2 refueling outage will be conducted by NECS. NECS will report the results of this review to a special Technical Review Group (TRG) which will address the adequacy of NECS DCPs. This review will be complete by August 1989, prior to the next refueling outage for Unit 1.

C. Safety System Outage Modification Inspection (SSOMI) audits of design changes that are performed during refueling outages are being conducted. The PG&E SSOMI team composition will include sufficient numbers of personnel with the technical expertise/background to question the adequacy and completeness of engineering activities and calculations.

Discussion of Specific Findings

PG&E has reviewed the specific findings in the Inspection Report and a discussion is provided below.

A. In two cases, deviations from engineering design procedures contained in the Engineering Manual were identified.

1. The ASW Overcurrent Relay Issue

The requirement for testing and engineering acceptance was not specified in the appropriate location in the DCN as required by NEMP 3.6 ON and NEMP 3.12, "Spare and Replacement Parts Evaluation," but instead was noted in a location used to require submittal of vendor information for incorporation into the records system. The ASW overcurrent relay issue was described in LER 1-88-032 (PG&E Letter DCL-89-083, dated March 29, 1989).

2. The Safety Injection Pump Weight Issue

Failure to finalize a calculation prior to release for operation is clearly in conflict with engineering procedures. The plant was returned to operation following completion of an evaluation by Westinghouse of the effect of the increased safety injection pump weight, but before completion of calculation verification by Westinghouse. Verification was necessary to finalize the calculation in accordance with established procedure.

Engineering acceptance of the installed condition, with consideration for increased weight, was based on a review of critical stress ratios by two PG&E senior and experienced structural analysts. They considered the substantial existing margin to be sufficient to provide assurance of continued qualification, and thus considered their assessment to be adequate verification for return to operation in lieu of complete verification by Westinghouse. The completion of detailed verification by Westinghouse substantiated their conclusion. Retraining is being provided to assure that the design change process requirements are vigorously followed.

B. In one case, personnel oversight resulted in a design change being issued without review of one of the calculations potentially impacted by the change. See LER 1-88-032 for a detailed discussion of this issue.

C. The NRC team reviewed the calculations associated with (1) control room ventilation, (2) temporary containment Penetration No. 63, and (3) instrument setpoints. The following is a discussion in response to the NRC concerns identified as a result of these reviews.

1. The reviewer identified that the control room ventilation calculations "did not fully identify design assumptions and did not reference input information such that it could be located or confirmed." However, the reviewer further stated that, "In most cases reviewed, a reasonable basis was established for the temperatures and other input information in these calculations." In addition, the reviewer identified a specific case which is presumed to be most serious, involving the case of a calculation, where no specific basis could be located for the temperature in the turbine building during design basis conditions (108°F). It was determined that this value was a reasonable estimate of turbine building conditions (based upon actual recorded values), and it had a relatively minor effect on the calculated result (i.e., about 1% of the total heat load).

   The extent to which design assumptions were identified and referenced was adequate to verify the basis and adequacy of the design. The most serious omission was found to be the use of a "realistic value" which had a very small effect upon the calculated results. In this regard, it must be recognized that both the NRC and PG&E threshold for requiring documentation of such judgments and input bases has escalated with the passage of time, and these calculations were performed in the February through April 1983 timeframe.

2. The reviewer of the calculation which had been prepared to support the "install and remove" design change for Penetration No. 63 identified that "The documentation of input information was not sufficiently clear to be reviewed without recourse to the originator. Specifically, it appeared that the containment internal temperature increase due to solar heating had been overlooked. After discussing the calculation with the originator, it was learned that solar heating had been included, but that the documentation of input information was not clear."

   The basis for this calculation was clearly documented to be:

   a. Initial condition presumed to be a pressure equal to the containment supply fan maximum discharge pressure and an ambient temperature of 80°F.

   b. Air leakage from pneumatic devices of 16 SCF in 12 hours.

   c. All doors and penetrations sealed as required by the refueling modes of operation.

   d. A 20°F rise in temperature from ambient.

The 20°F rise was margin included in the calculation to account for the effects of all postulated variables (i.e., solar heating, ambient temperature variations, changes to internal heat generation from equipment and personnel, etc.). However, solar heating effects are minimal for the containment due to the geographic location of the plant and the three-foot thick concrete construction.

3. The reviewer observed an "absence of safety-related instrument setpoint calculations in areas of engineering responsibility. Such calculations ordinarily provide the design basis for Class IA (i.e. safety-related) and some Class IB, IC, and II instrument setpoints." Examples, found by the inspector and presumed to be the most serious cases of minimal calculations are:

"a. 4 KV switchgear ventilation TIS-5067, -5068, and -5069 temperature controls used to operate three fans;

b. Control room ventilation time delay relays 62-1F and T4AX-1 used in modes 3 and 4;

c. Diesel generator fuel oil relief valves RV-216 and -217, which were revised from 60 to 110 psig;

d. Diesel generator fuel oil day tank and storage tank level switches; and

e. Containment ventilation flow switch (FS-700) and associated time delay relay, which was changed from 10 to 60 seconds."

The report continues with the observation that "The design basis for these setpoints could be reconstructed from various drawings, instrument lists, procedures, and instructions, but was not collected together as it would be in a formal setpoint calculation."

PG&E agrees that assembly of the design basis for setpoints in a central location under a single set of calculations is a desired practice which will enhance both Engineering and Operations programs. In addition, it provides documentation in a format to better facilitate the audit/inspection process. The need to create a single calculation for each setpoint and to provide a reference to the calculation and design basis in the setpoint documents was recognized and mandated by the PG&E Configuration Management Enhancement Program in 1988. PG&E's setpoint control effort related to (1) safety-related setpoints; (2) setpoints which could cause challenge to safety systems; and (3) setpoints which substantially affect overall plant operations, will be completed this year. However, two of the above five examples, the control ventilation time delay relay and the containment ventilation flow switch time delay relay, do not satisfy the three conditions above and, thus, will not be included in this program.

TABLE 1

PLANT SYSTEM ENGINEER AND SYSTEM DESIGN ENGINEER ACTIVITIES

1. Routine System Walkdowns
2. Evaluate System Problems*
3. Trend System Performance
4. Technical Reviews and Safety Evaluations
5. Design Sponsorship*
6. Operating Experience Assessment*
7. Training Material Review*
8. Task Coordination*
9. Regulatory Reviews*
10. Readiness for Restart Evaluation*
11. System Engineer/Design Engineer Interface
12. System Engineer/Maintenance Department Interface
13. System Engineer/Operations Engineer Interface

(* = Plant System Engineer Only)

ENCLOSURE 2

REPLY TO NOTICE OF VIOLATION
REGARDING A GE/GW VENTILATION MODIFICATION
IN NRC INSPECTION REPORT NOS. 50-275/89-01 AND 50-323/89-01

On March 21, 1989, in Appendix A of NRC Inspection Report Nos. 50-275/89-01 and 50-323/89-01 (Inspection Report) for the Diablo Canyon Power Plant (DCPP) Units 1 and 2, NRC Region V issued a Notice of Violation citing six Severity Level IV Violations for Unit 2 regarding, in part, a GE/GW area ventilation modification.

PG&E has completed its evaluation and agrees that the violations occurred as described in the Inspection Report. As noted in several of the responses to the violations, PG&E had identified some of the problems. As discussed below, PG&E believes that the issues associated with the GE/GW area ventilation modification resulted from a failure to identify the proper mode constraint applicable to placing this equipment in service. Consequently, PG&E considers that NOVs A.1.a, A.1.b, A.4 (partial), A.5, A.6, and C.a essentially result from the same cause. A background discussion and the responses to these NOVs are provided in this enclosure. Corrective actions are being taken by PG&E to verify that open safety-related design change packages are reviewed to ensure that equipment placed in service is acceptable for operation, and to use the partial closure process when appropriate.

The event background, the statements of violation, and PG&E's reply to each violation follow.

BACKGROUND

Design Change Package (DCP) H-38182 was initiated to install ducting which would connect the GE/GW area of the auxiliary building to the plant vent. Plant Operations reviewed DCP H-38182 prior to the second Unit 2 refueling outage, as part of the outage planning for all outage DCPs, to identify the mode by which they must be completed.

After a determination regarding the DCP mode requirement has been made, the applicable mode requirement is entered into a database that contains similar information for all outage DCPs. Prior to mode transitions, this database is reviewed to ensure that DCPs identified as mode constraints are partially or fully closed to fulfill mode transition requirements. The partial closure process, although not proceduralized in detail, is intended to apply full design change closure requirements, thus allowing that portion to be placed into service in compliance with operating, maintenance, and design bases requirements.

9rior to placing the equipment into operation, the partial closure process specified in Administrative Procedure (AP) C-1S1 "Onsite Plant Modification Administration," and NEMP 3.6 ON, "Operating Nuclear Power Plant Design Changes," provides for signatures to be obtained to document: (1) review for construction/inspection completion; (2) review for compliance with design bases; and (3) completion of all required functional testing.

DCP H-38182 was assigned a "No-Mode" designation since the Technical Specifications (TS) do not explicitly impose operational requirements on the plant vent. This "No-Mode" designation meant that closure or partial closure would not be required. In effect, a thorough review would be completed only after the installation was complete. However, it was known that the vent needed to function as part of the ventilation system in all modes because other systems required for mode changes were connected to this vent. The portion of this modification which caused concern was the tie-in of the new duct to the plant vent. For personnel safety, tie-in would require shutting down the exhaust fans, which is accomplished using the clearance process. However, the clearance process would not provide the same controls as are provided by use of the partial closure process. Consequently, the "No-Mode" designation to perform this work did not provide sufficient administrative or procedural controls to assure that the duct installation was sufficiently complete for return to service.

The DCP installation should have been performed with the identification that the ducting installation was required to be operational prior to Mode 4. This action would have ensured that the completed portion of the DCP was properly placed in operation in accordance with the partial closure process.

The Class I portion of the DCP (two isolation dampers, 2FCV-5160 and 2FCV-5161, and a common duct) was installed, leak tested, and tie-in completed prior to Mode 5 entry on October 31, 1988. The isolation damper operators are spring-loaded to hold the dampers closed. These dampers could not be inadvertently opened, since opening would require either a very large wrench or an air supply with sufficient air pressure to overcome the spring. Operating Procedure (OP) H-1:I, "Auxiliary Building Ventilation System, Make Available And System Operation," was changed on November 14, 1988, to include a step to check and ensure that the isolation dampers were closed prior to returning the plant vent to service. A walkdown was performed by Operations to ensure that the installed isolation dampers were in the closed position. Since the Class I to Class II duct connection was not ready to be made, a duct test cap installed during construction to permit duct leak testing was left in place as a pressure boundary.

Due to the "No-Mode" designation, Mode 4 was entered on November 27, 1988, without partially closing DCP H-38182. The installation was in an indeterminate status (not inspected and documented as acceptable), thus potentially invalidating qualification of the plant vent to which the duct was attached.

Shortly after entering Mode 4, a walkdown of the partially complete modification was performed by GC to determine if the ducting installation met pressure boundary requirements. Action Request (AR) A0133411 was initiated on December 1, 1988, to identify incomplete duct bracing and request NECS to evaluate whether the existing physical configuration met operability requirements. On December 2, 1988, in response to the AR, the engineering evaluation (Calculation No. HV2-705 Rev. 7) demonstrated that the plant vent, the HVAC duct, and the duct supports met design requirements. The evaluation was presented to the Plant Staff Review Commitee (PSRC) by NECS on December 2, 1988. After being informed by NECS that the identified problems did not constitute an operability concern, the PSRC directed that this issue be resolved by a Technical Review Group. This evaluation was being conducted concurrently with the NRC Special Inspection.

Field Change (FC) M-11986-Rev. 0 to DCP H-38182 was initiated on December 7, 1989, and approved on December 12, 1988, to provide NECS acceptance of the ability of the installed duct test cap to provide an adequate pressure boundary.

PG&E concludes that the immediate cause of the GE/GW issue was the failure to identify the DCP as a mode transition constraint. There are two policies which, had they been in place, would have prevented this occurrence:

- Even though the plant vent was not specifically mentioned in the TS, the operator correctly linked it to the operability of various active components in the ventilation system. The operator should have automatically applied the same mode constraints to this duct as to the most limiting of the components.

- Equipment in a DCP should not be relied upon for operation unless a partial closure of the affected portions of the DCP is conducted.

The corrective action for this GE/GW issue is to provide adequate procedural guidance to enable personnel to better evaluate and identify mode constraint issues.

As indicated in the Inspection Report, PG&E QS Quality Support (QS) had identified the failure to perform a partial closure for DCP H-38182 a part of their SSOMI. A more timely evaluation of the GE/GW modification operability concerns should have been conducted following identification of the lack of partial closure by QS on December 2, 1988. This delay in evaluation essentially resulted from the DCP originally having been identified as "No-Mode." PG&E believes that corrective steps which will be taken to provide adequate procedural guidance on determining DCP mode constraints will result in better mode constraint identification.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

1. Diablo Canyon Nuclear Engineering Procedure No. 3.6, Revision 8, "Operating Nuclear Power Plant Design Changes," which provides controls over modification work, states in section 4.8, "Design Change Notice (DCN) and Design Change Package (DCP) Closure": If a portion of the design change is required to be declared operational prior to completion of the work, DCPP will submit as-builts to engineering on a Field Change Transmittal (FCT) for partial closure of the DCP. After engineering acceptance of the FCT, the group supervisor indicates engineering concurrence on the outage partial closure form. Processing of the DCN is then continued according to this procedure." Processing of the DCN includes updating plant drawings to reflect the modification work that has been completed.

   a. Contrary to the above, as of November 29, 1988, the GE/GW Ventilation System was declared operational although a partial closure of DCP H-38182, which modified the GE/GW Ventilation System, had not been completed, and a Field Change to the DCP, which was needed to declare the system operational, had not been approved.

   This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. The GE/GW area ventilation system modification was declared operational without partial closure of DCP H-38182 and without issuance and approval of Field Change (FC) M-11986.

As discussed in the above background, this situation resulted from failure to identify the proper mode constraint applicable to placing this installation in service. As discussed in the Inspection Report, the failure to perform the partial process was identified by PG&E QS on December 2, 1988.

If DCP H-38182 had been identified as a Mode 4 transition constraint, then the mode requirement would have been entered into the database. Prior to Mode 4, this database was reviewed, and if DCP H-38182 had been identified as a Mode 4 constraint, then partial closure would have been required in accordance with NEMP 3.6 ON and AP C-1S1.

As discussed above, partial closure procedures require the installing, startup, and responsible plant and Engineering organizations to sign the partial closure form to concur that the partially completed installation is acceptable for return to service. The installing organization reviews the partial installation to ensure that it is adequate for partial closure, that QC inspections are adequate, and prepares the as-built drawings. Had the partial closure process been used, then the duct bracing and pressure boundary issues would have been resolved by the installing organization through this process. Engineering then would have ensured that the installation was complete enough for partial closure, and would have resolved and approved any structural or pressure boundary issues prior to signing the partial closure form.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

The following corrective steps have been taken:

1. Partial closure of the DCP was completed on January 31, 1989.

2. The adequacy of the new GE/GW area ventilation ductwork in its as-found condition was confirmed by NECS and documented in a January 31, 1989, letter from NECS to DCPP.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

The following corrective actions will be taken to prevent future violations:

1. All open, safety-related DCPs will be reviewed to ensure that equipment placed in service is acceptable for operation.

2. Plant procedures will be revised to assign mode requirements for the most limiting applicable components when dealing with a component for which there are TS requirements.

3. Plant procedures will be revised to ensure that systems turned over to Operations have a partial or full closure.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance. The open DCP review will be completed by June 30, 1989. The procedures AP C-1S1 and AP C-6S1, "Clearance Request/Job Assignment," will be revised by July 30, 1989.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

1. Diablo Canyon Nuclear Engineering Procedure No. 3.6, Revision 8, "Operating Nuclear Power Plant Design Changes," which provides controls over modification work, states in section 4.8, "Design Change Notice (DCN) and Design Change Package (DCP) Closure": If a portion of the design change is required to be declared operational prior to completion of the work DCPP will submit as-builts to engineering on a Field Change Transmittal (FCT) for partial closure of the DCP. After engineering acceptance of the FCT, the group supervisor indicates engineering concurrence on the outage partial closure form. Processing of the DCN is then continued according to this procedure." Processing of the DCN includes updating plant drawings to reflect the modification work that has been completed.

b. Contrary to the above, the Operations Valve Identification Diagrams for the auxiliary building ventilation system were not updated as of January 24, 1989, to encompass the portion of the modification which included two isolation dampers, 2FCV-5160 and 2FCV-5161, which had been added to the Ventilation System.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. The DCPP Operations Valve Identification Diagrams (OVIDs) for the auxiliary building ventilation system were not updated prior to declaring the GE/GW area ventilation system modification operational.

As stated above in the background section, this situation resulted from failure to identify the proper mode constraint applicable to placing the equipment in service.

The Plant Modification Check List (PMCL), filled out by the DCP H-38182 sponsor, identified that OVIDs were to be updated prior to returning the duct installation to service. If partial closure for DCP H-38182 had been required, then according to AP C-1S1, the sponsor would sign the partial closure form to indicate that all PMCL-identified operability concerns have been met.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

Although an OVID change had not been initiated prior to entering Mode 4, the affected ventilation system lineup procedure OP H-1:I was revised prior to Mode 4 entry to require that dampers 2-FCV-5160 and 2-FCV-5161 be checked in the closed position. The damper positions were verified to be in the closed position. Since the dampers had not yet been declared operable, it was judged not necessary to update the OVID. Following QS identification of the problem, OVID 107723, Sheet 3 was revised on January 20, 1989, to incorporate the new duct and dampers.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E believes that, based on the above corrective actions which have been taken and the corrective actions described in the response to Violation A.1.a regarding the DCP partial closure process, no further corrective actions are necessary.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

4. Mechanical Maintenance Procedure M-54.1, revision 4, states, in part, in section 2.3, "This procedure will provide guidance for the majority of bolted connections at Diablo Canyon. Those ... conditions that are not covered by this procedure are to be analyzed on a case by case basis by a Mechanical Maintenance Engineer." Section 7.3.3 states, "Inspect the fasteners threads ... Verify bolt is long enough to completely engage the nut."

Contrary to the above, as of January, 1989, four flange bolts on the SI pump 2-2 cooling water line and 14 of 16 fasteners supporting dampers 2-FCV-5160 and -5161 in the GE/GW Ventilation system did not have full thread engagement, and an evaluation had not been performed.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. Fasteners supporting dampers 2-FCV-5160 and 2-FCV-5161 did not have full thread engagement and an evaluation had not been performed. The NRC identified this problem during an Inspection Walkdown on January 25, 1989. (Causes and corrective actions for the SI pump 2-2 cooling line flange bolt are different from those identified for the GE/GW DCP problems and are discussed in Enclosure 3.)

Fourteen fasteners supporting the duct dampers were short bolts. These short bolts were only intended as temporary construction aids until longer bolts could be obtained, at which time the short bolts would be changed out. The work orders containing the steps to install the bolts had not been closed out. As discussed above, this situation resulted from failure to identify the proper mode constraint applicable to placing the equipment in service.

If the partial closure process had been required, then the installing organization would have ensured that the proper length bolts were installed as part of their review of the work orders to verify that the installation was complete enough for partial closure.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

The bolts supporting the duct dampers were replaced on January 25, 1989. Civil Engineering Calculation HV2-705, Revision 15, was performed, which demonstrated that, even with less than full thread engagement, the bolts had sufficient capacity to satisfy the design criteria.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E believes that based on the corrective actions described in the response to Violation A.1.a, regarding the DCP partial closure process, no further corrective actions are necessary.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

5. Administrative Procedure NPAP C-40, "General Requirements for Plant Maintenance Programs," states in section 4.16.1, "Maintenance which can affect the performance of safety related equipment shall be performed in accordance with written procedures ...."

Contrary to the above, on January 26, 1989, plant personnel replaced bolts connecting seismic supports for isolation dampers 2-FCV-5160 and -5161 in the GE/GW Ventilation System without written work instructions or procedures.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. Support bolts for the isolation dampers were replaced without written work instructions. The work order to install these bolts was still open after the ducting had been placed in service. Because the work was considered to be in progress, the longer bolts were individually installed and inspected in accordance with GC HVAC bolt installation Procedure DCP-502, "Installation and Testing of HVAC Duct and Equipment."

If the partial closure process had been required, then as discussed in the response to A:4 above, the bolts would have been replaced prior to returning the ventilation ducting to service. Consequently, the situation which led to this incident would have been avoided.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

As noted in the response to Violation A.4, Civil Engineering Calculation HV2-705, Rev. 15, demonstrated that the bolt configuration resulting from the method used to replace the bolts was sufficient to satisfy the design criteria.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E believes that based on the above corrective action which has been taken and the corrective actions described in the response to Violation A.1.a regarding the partial closure process, no further corrective actions are necessary.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

6. General construction procedure DCP-117, revision 0, states in section 4.5.1 that, "The welding inspector shall verify conformance of welding to the requirements of the Weld Inspection Plan."

Contrary to the above, nine welds on the GE/GW modification (DCP H-38182) were not inspected in accordance with the Weld Inspection Plan prior to the system being declared operable for startup on November 29, 1988.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. Inspection records for nine welds on the GE/GW area ventilation ducting were not signed off by a QC Inspector in accordance with the Weld Inspection Plan prior to declaring the ventilation system operable. The nine weld problems were identified on January 25, 1989, by NECS-GC during the partial closure process. However, these welds had been inspected and accepted by a GC mechanical inspector.

A partial closure of the DCP for the Class I portion of the work would have required a complete review of the work order by GC Mechanical and GC Quality Control (QC), which would have identified the missing weld inspection documentation. All the weld inspection records require a signature by QC, and the unsigned spaces on the weld inspection record forms would have been noticed during review by both GC Mechanical and GC QC personnel.

As stated above, this situation resulted from failure to identify the proper mode constraint applicable to placing the equipment in service.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

The configuration of the nine welds were evaluated and accepted by NECS.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E believes that, based on the above corrective actions which have been taken and the corrective actions described in the response to Violation A.1.a regarding the DCP partial closure process, no further corrective actions are necessary.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance.

STATEMENT OF VIOLATION

"C. 10 CFR 50, Appendix B, Criterion V, requires, in part, activities affecting quality to be accomplished in accordance with documented procedures.

Procedure QAP-15.A, "Quality Problems," states, in part, in section 4.2, "If a potential quality problem is detected, an AR (Action Request) shall be generated."

Contrary to the above:

a. Design Change Package DCP-H-38182, Duct Support Inspection Record C0033403, identified an anchor bolt that did not meet the required torque of 180 ft-lbs for the GE/GW Ventilation Modification and an AR was not prepared and further action was not taken to evaluate the discrepancy. Work on the DCP was stopped in December, 1988, to allow Unit 2 to return to service.

b. On January 25 and 26, 1989, numerous obvious discrepancies existed with electrical conduits, loose pipe hangers, and missing nuts and washers on pipe hangers associated with SI pump 2-2, that were not reported on an Action Request.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

a. PG&E agrees with the Statement of Violation. The anchor bolt for the GE/GW area HVAC modification did not meet the required torque and an Action Request (AR) was not issued and evaluated prior to the GE/GW modification being made operable. The bolt slipped in its hole during the initial tightening, and although the bolt embedment was greater than the minimum required, there was insufficient thread to allow torquing to be completed. This problem was noted on the open work order. A Field Change was approved on December 27, 1988, to weld a spacer plate to the baseplate in order to allow the anchor bolt to be properly torqued. The spacer was installed and the bolt retightened, but retorquing the bolt had not been signed off by GC-QC when this was identified as a problem on January 25, 1989, by NECS GC during the partial closure process. A partial closure of the DCP for the Class I portion of the work would have required a complete review of the work order, which would have identified the bolt torquing problem on the incomplete bolt inspection record.

As stated above, this situation resulted from failure to identify the proper mode constraint applicable to placing the equipment in service.

b. Causes and corrective actions for the SI pump 2-2 issues are different from those identified for the GE/GW DCP problems and are discussed in Enclosure 3.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

A spacer plate was added, and the anchor bolt was retorqued to 180 ft-lbs and accepted on January 25, 1989.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E believes that, based on the above corrective actions which have been taken and the corrective actions described in the response to Violation A.1.a regarding the DCP partial closure process, no further corrective actions are necessary regarding the GE/GW modification anchor bolt. GC and plant personnel will be tailboarded on this problem.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The GE/GW modification is in full compliance.

ENCLOSURE 3

REPLY TO NOTICES OF VIOLATION
IN NRC INSPECTION REPORT NOS. 50-275/89-01 AND 50-323/89-01

On March 21, 1989, in Appendix A of NRC Inspection Report Nos. 50-275/89-01 and 50-323/89-01 (Inspection Report) for the Diablo Canyon Power Plant (DCPP) Units 1 and 2, in addition to the NOVs discussed in Enclosure 2, NRC Region V issued a Notice of Violation citing two Severity Level IV Violations for Unit 1 and one Severity Level IV Violation for Unit 2. PG&E's replies to these three violations are provided below. Further, two of the NOVs discussed in Enclosure 2 included issues unrelated to the GE/GW area ventilation modification; these issues are also addressed below.

The Statements of Violation and PG&E's reply to each follow.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

2. PG&E Nuclear Engineering Procedure 3.6, Revision 8, "Operating Nuclear Power Plant Design Changes," which provides controls over modification work, states in part: "A change is considered to be within the intent of the DCP if ... it does not conflict with any functional requirements of the DCP ...." The procedure further states that "A complete description of the proposed change will be provided ... forwarded for concurrence ..." then "After concurrence ... will submit the FC [Field Change] to DCPP for approval."

Contrary to the above, design change package DCP-37346 was modified by the licensee's General Construction organization in April, 1988 to delete the requirement for post-modification testing without submitting a Field Change to DCPP for approval. DCP-37346 relocated the control board location of the control switch which aligns startup transformer 1-2 to the 4160 volt electrical distribution system.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 1."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. General Construction (GC) did not conduct post-modification testing of the relocated breaker control switch as specified by the approved DCP and did not use the proper change process to cancel the test. The DCP work involved moving the breaker switch approximately three inches to reduce the potential for inadvertent operation.

The Plant Staff Review Committee (PSRC) approved use of Electrical Performance Test Procedure 52.2, Addendum 1, "Startup Transformer 12 Feeder to 4 kV Buses F, G, and H (52HG15)," as a post-modification test for the DCP. A memorandum from General Construction, Electrical to General Construction, Startup, dated April 28, 1988, cancelled the test. The rationale for cancellation was that it was not necessary to disconnect or connect any wiring to relocate the breaker control switch, and therefore post-modification testing was not necessary. However, GC personnel did not use the field change process to cancel the test. Project Instruction PI-47, "Field Changes," describes change processes that include the appropriate review and approval.

The installation and testing procedures included as part of the DCP were intended as guidelines to the installation and testing organization. This practice was consistent with the existing procedure, NEMP 3.6 ON. Quality Control (QC) inspection hold points had been established in the installation work order to inspect the work in process. The GC field engineer and QC inspector concurred that the electrical wiring did not need to be disconnected from the switch since it was only being relocated approximately three inches from its position on vertical board IVB4. At the time of the modification, the testing organization (GC Startup) was responsible for identifying engineering limitations, test requirements, and test acceptance criteria from controlled design documents provided by the design organization. GC Startup accepted the recommendation from GC Electrical that no post-modification testing was required since the control switch circuit had not been changed.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

The wiring behind the 4 kV startup transformer bus control switch was inspected by GC Electrical to ensure that there was no damage to wiring during the relocation activities.

GC testing organizations have been tailboarded on this event to emphasize that test requirements identified in DCPs are firm requirements that must be performed or, alternatively, a Field Change submitted in accordance with PI-47 to change the DCP.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

Electrical Performance Test Instruction (EPTI) 10.5, "General Instructions for Electrical Performance Tests," and Project Instruction PI-67, "Construction Work Package Development and Control Using Work Orders," will be revised by GC to include cancellation requirements for PSRC-approved post-modification testing procedures. NECS is responsible for including test and acceptance criteria in DCNs to assure that critical design basis functions are demonstrated by test prior to release for operation; NEMP 3.6 ON has been revised accordingly.

NPAP C-1/NPG 4.2 will also be revised to indicate that NECS is responsible for specification of installation and testing criteria for design modifications.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The control switch was satisfactorily inspected by GC Electrical to ensure there was no damage to the switch during relocation. PG&E is now in full compliance. The revisions to EPTI 10.5 and PI-67 will be completed by May 15, 1989. Revision to NPAP C-1 will be completed by June 30, 1989.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

3. The procedural steps delineated in design change package DCP 42447, which installed Class I support 2CSR-127-5-7457, required the support to be located 4 feet-0 inches (plus or minus 12 inches) from an existing support.

Contrary to the above, as of January 24, 1989, the support was located 2 feet-8 inches from the existing support and the DCP spacing requirement had not been changed.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. The support was installed 2'-8" from an existing type S-571 support, which is outside the dimensional tolerance (4'-0" plus or minus 12") specified by the design drawing without using the appropriate field change process. The new support could not be installed as required by the DCP because of interferences on the ceiling of the cable spreading room.

The Class 1 support modification described in DCP C-42447 involved (1) installation of a new support, and (2) removal of conduit clamps from an intermediate support between the location of the new support and another existing support. The basis of the 4'-0" (plus or minus 12") on the design drawing was as follows:

a. The distance from the existing support to the intermediate support to be removed was known to be 3'-6".

b. The distance from the intermediate support to the location of the new support was estimated during a walkdown to be 4'-0". The plus or minus 12" was indicated on the drawing to reflect the fact that the 4'-0" distance was only an estimate, and to assure that the maximum span between supports after removal of the intermediate support and installation of the new support would not exceed 8'-6", the maximum spacing between raceway supports discussed below. The minus 12" portion of the permitted deviation merely reflected the fact that the dimension was an estimate.

The maximum spacing between raceway supports as shown in Drawings 050029 and 050030 is 8'-6". This drawing was issued as the Standard for raceway construction. This maximum span information is clearly understood by General Construction and QC and is incorporated in GC Electrical Procedure DCP-304, "Installation of Electrical Raceways and Raceway Supports." Since the as-built 6'-2" (3'-6" plus 2'-8") span in the modified support configuration is substantially lower than the maximum span (8'-6") allowed, the QC engineer judged the installation as acceptable without requiring additional engineering evaluation.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

Tailboards were conducted with GC electrical planners, field engineers, QC inspectors, and electricians on the circumstances of this event, reemphasizing the importance of checking design specifications to ensure correct installations, and obtaining authorization for deviation via the field change process prior to installation.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

PG&E has taken the action that is needed to preclude the occurrence of future events of this nature.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

PG&E is in full compliance.

STATEMENT OF VIOLATION

"A. Technical Specification 6.8.1 requires, in part, written procedures to be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, Appendix A, paragraphs 9a and 9e, list in part, procedures for control of modification work and control of maintenance work.

4. Mechanical Maintenance Procedure M-54.1, revision 4; states, in part, in section 2.3, "This procedure will provide guidance for the majority of bolted connections at Diablo Canyon. Those ... conditions that are not covered by this procedure are to be analyzed on a case by case basis by a Mechanical Maintenance Engineer." Section 7.3.3 states, "Inspect the fasteners threads ... Verify bolt is long enough to completely engage the nut."

Contrary to the above, as of January, 1989, four flange bolts on the SI pump 2-2 cooling water line and 14 of 16 fasteners supporting dampers 2-FCV-5160 and -5161 in the GE/GW Ventilation system did not have full thread engagement, and an evaluation had not been performed.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation. The SI pump 2-2 cooling line and the fasteners supporting dampers 2-FCV-5160 and 2-FCV-5161 did not have full thread engagement and an evaluation was not performed.

For the specific SI pump 2-2 cooling line flange bolts discussed in the Statement of Violation, nuts were placed on both ends of the stud. By procedure, the stud length was verified as adequate for full thread engagement. However, during installation the studs were not centered between the nuts. The location of the studs relative to one set of nuts allowed four of the nuts on one side of the flange to have excess length, thereby causing the bolt projection on the other side to be inadequate for full thread engagement. The maintenance procedure was considered to be adequate in that minimum stud length was required to be verified prior to installation. Strict attention to detail during the maintenance activity would have prevented the lack of full thread engagement.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

The flange bolts were reinstalled to provide for full thread engagement on both sides of the flange. PG&E performed an engineering calculation to analyze the potential consequences of incomplete thread engagement on one end of the bolts. The calculation (P-209001 Rev. 0) determined that there had been sufficient thread engagement on the four flange bolts on the SI pump 2-2 seal water cooling line.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

Maintenance Procedure (MP) M-54.1, "Bolt Torquing," is being revised to specify the requirements for full thread engagement and to require verification of full thread engagement after final torquing to ensure that not only is the stud length adequate, but that full thread engagement is achieved.

Other applicable maintenance procedures and contractor procedures will be reviewed to verify the requirement for full thread engagement for various plant components. A Maintenance Bulletin will be issued regarding the proper method of achieving full thread engagement. Plant personnel will be tailboarded on the revision to MP M-54.1.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The flange bolts have been appropriately reinstalled.

Procedure MP M-54.1 will be revised by April 30, 1989. The review of other applicable procedures will be completed by May 31, 1989. Any other appropriate procedure revisions will be made by July 31, 1989. The Maintenance Bulletin will be issued by May 31, 1989.

STATEMENT OF VIOLATION

"B. 10 CFR 50.59 allows Licensee's to make changes in their facility as described in the safety analysis report, provided in part that a written safety evaluation determines that the change does not constitute an unreviewed safety question.

Contrary to the above, as of January 11, 1989, 480 volt power cables had been installed in the plant and attached to instrumentation conduits associated with the Unit 1 Control Room Pressurization System without the completion and approval of a written safety evaluation considering the electrical design criteria stated in the Final Safety Analysis Report.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 1."

REASON FOR THE VIOLATION

PG&E agrees with the Statement of Violation that the temporary 480V cable was attached to instrumentation conduits RE-51, CE-101, and KA-110 without a written safety evaluation.

NPAP C-1/NPG 4.2 requires an engineering evaluation for all design changes, and the procedure further states that all temporary design changes are to be evaluated as permanent design changes.

The temporary hanging of cables had not been considered a "design modification" and, therefore, no safety evaluation was performed.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

An engineering evaluation was performed that determined that the temporary 480V cable being attached to the conduits had no adverse impact.

The temporary 480V power cable has been detached from the conduit.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

Existing acceptance criteria for Class II cable installations will be used to conduct a plant walkdown that will identify any other temporary cables that may have been supported without an evaluation.

A policy letter will also be issued to all plant groups to clarify when a temporary installation requires a design change and to sensitize plant personnel that temporary plant modifications can affect the plant design basis.

NPAP C-1/NPG 4.2 will be revised to provide a list of typical temporary installations that are considered to be temporary design changes and to specify the manner in which the temporary installations are to be processed.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The temporary cable has been removed from the conduit.

The plant walkdown will be completed by June 30, 1989. Any identified problems will be promptly corrected. The policy letter will be issued by April 30, 1989. NPAP C-1/NPG 4.2 will be revised by June 30, 1989.

STATEMENT OF VIOLATION

"C. 10 CFR 50, Appendix B, Criterion V, requires, in part, activities affecting quality to be accomplished in accordance with documented procedures.

Procedure QAP-15.A, "Quality Problems," states, in part, in section 4.2, "If a potential quality problem is detected, an AR (Action Request) shall be generated."

Contrary to the above:

a. Design Change Package DCP-H-38182, Duct Support Inspection Record C0033403, identified an anchor bolt that did not meet the required torque of 130 ft-lbs for the GE/GW Ventilation Modification and an AR was not prepared and further action was not taken to evaluate the discrepancy. Work on the DCP was stopped in December, 1988, to allow Unit 2 to return to service.

b. On January 25 and 26, 1989, numerous obvious discrepancies existed with electrical conduits, loose pipe hangers, and missing nuts and washers on pipe hangers associated with SI pump 2-2, that were not reported on an Action Request.

This is a Severity Level IV Violation (Supplement I) applicable to Unit 2."

REASON FOR THE VIOLATION

a. See Enclosure 2 for discussion of this issue.

b. PG&E agrees with the Statement of Violation. An Action Request (AR) was not generated to document discrepancies associated with SI pump 2-2. An AR was not generated due to inadequate attention to detail during reassembly of the SI pump 2-2.

CORRECTIVE STEPS TAKEN AND THE RESULTS ACHIEVED

Actions have been initiated to correct the SI Pump 2-2 discrepancies. A Maintenance Policy memorandum has been issued to maintenance personnel regarding configuration control.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FUTURE VIOLATIONS

All the SI pump 2-2 discrepancies will be corrected by May 31, 1989. A Maintenance Bulletin will be issued to all maintenance personnel concerning attention to detail. All maintenance personnel will be tailboarded on this event.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

All SI pump 2-2 discrepancies will be corrected by May 31, 1989.

The Maintenance Bulletin will be issued by April 30, 1989. The tailboard of maintenance personnel will be completed by April 30, 1989.

ENCLOSURE 4

REPLY TO NOTICE OF DEVIATION
NRC INSPECTION REPORT NOS. 50-275/89-01 AND 50-323/89-01

On March 21, 1989, as Appendix B of NRC Inspection Report Nos. 50-275/8-01 and 50-323/89-01 (Inspection Report) for Diablo Canyon Power Plant (DCPP) Units 1 and 2, NRC Region V issued a Notice of Deviation from commitments to the NRC. In accordance with the "General statement of policy and procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the deviation is listed below:

"UFSAR, Page 9.4-8 states in part, that:

> 'With complete recirculation of the ventilation air, the carbon dioxide buildup is not expected to exceed an acceptable concentration of 1% by volume in 40 hours with 20 persons in the Unit 1 and 2 control room complex. Information will be available to the operator on CO_2 buildup with more or fewer persons in the area so that appropriate measures may be taken...'

Contrary to the above, at the time of the inspection no information was available to the operators on CO_2 buildup.

This is a Deviation."

REASON FOR THE DEVIATION

As stated in the Notice of Deviation, no information was furnished to operators on CO_2 buildup in the control room during extended operation with the control room ventilation system (CRVS) in Mode 3 operation as stated in the FSAR Update, p. 9.4-8. This information previously was not available and was not provided to the operators. Breathing apparatus are available for use by control room operators when required.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED

An engineering analysis on maximum man-hour occupancy as a function of occupancy level has been performed and has been transmitted to the Operations department.

Emergency Procedure (EP) M-3, "Chlorine or Ammonia Release," has been revised to advise operators that the control room atmosphere will be acceptable for up to 40 hours if the room is occupied by 20 people or less. If the ventilation system is to be in the full recirculation mode for greater than 40 hours or the number of persons in the control room is greater than 20, the procedure will advise that the Technical Support Center Staff be requested to provide further instructions on system operation.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER DEVIATIONS

The FSAR Update will be revised to be consistent with the change to EP M-3. As stated in Enclosure 1, PG&E will conduct a review of the FSAR Update and Safety Evaluation Reports for Diablo Canyon by System Engineers and System Design Engineers to confirm that FSAR Update statements are appropriately implemented.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

PG&E is in full compliance. The next FSAR Update is scheduled for September 1989.

ENCLOSURE 5

RESPONSE TO REQUEST FOR INFORMATION
IN NRC INSPECTION REPORTS 50-275/89-01 AND 50-323/89-01
REGARDING PG&E'S SSFAR/SSOMI INSPECTION PROGRAMS

The NRC letter dated March 21, 1989, that transmitted the subject Inspection Report identified four NRC conclusions regarding the conduct of PG&E's SSFAR/SSOMI inspection programs and requested a written response addressing these conclusions. A general PG&E comment on these inspection programs, a discussion of improvements to the SSFAR/SSOMI inspection programs, and PG&E's response to each of the NRC conclusions are provided below.

The PG&E SSFAR and SSOMI initiatives reflect PG&E's proactive commitment to identify potential problems and adequately implement timely corrective actions, thus providing PG&E with the added confidence that the Diablo Canyon Power Plant is being maintained and operated in a safe and reliable manner consistent with the licensed design bases of the plant.

As the NRC Inspection Report states, the NRC performed an independent SSFAR- and SSOMI-type inspection on systems previously reviewed by PG&E. The Inspection Report then refers to previous PG&E SSFARs. At the time of the NRC Special Inspection, PG&E had not conducted an SSFAR. Rather, the audits evaluated by the NRC were predecessors to PG&E's SSFARs, were designated "system audits," and focused, in part, on compliance-oriented reviews with increasing emphasis on technical aspects. The system audits were not as comprehensive as the SSFARs, and should not be referred to as SSFARs. PG&E believes this distinction is important for the reasons discussed below in response to the NRC conclusions on PG&E's inspection programs.

The first SSFAR began on February 26, 1989, after performance of the NRC Special Inspection. The scope of this initial SSFAR was to assess the operational readiness of the safety-related 125 VDC, 480 VAC, 120 VAC, and selected aspects of the diesel generators and 4160 volt systems. HVAC associated with the above systems was also reviewed. The report for the first SSFAR will be issued in May 1989. PG&E believes that this first SSFAR took into consideration each of the NRC's conclusions regarding the SSFAR program.

With respect to SSOMI program, PG&E recognizes that the NRC approach in the conduct of such inspections is to identify and resolve technically significant issues. The merit of the NRC approach has already been proven. At the time of the NRC inspection, PG&E had completed one SSOMI and was in the process of completing its second SSOMI. PG&E agrees that such programs, especially when newly implemented, will require continuous improvement to ensure that an

effective program is established. For example, the NRC Inspection Report characterized weaknesses in implementation, depth of review, and failure to witness craft personnel during the installation and testing of modifications. In this regard, the following improvements pertaining to the SSFAR/SSOMI programs have been or will be implemented:

1. PG&E's QA Department (QA) will provide other departments with training on the SSFAR/SSOMI assessment process so that they may better recognize the scope of such activities and enhance their responsiveness to SSFAR/SSOMI identified concerns. This additional training will be completed by September 1, 1989.

2. QA will provide additional performance-based training for SSOMI team members to enhance appraisal activities associated with design, installation, and testing activities. The training will be completed by September 1, 1989.

3. QA has provided and will continue to provide performance-based training for SSFAR team members prior to the start of each SSFAR.

4. QA will initiate the SSOMI assessment of design activities earlier in the SSOMI process to better utilize assessment resources later in this process and to increase observation of installation activities. Guidance will be provided to initiate the process at least 30 days prior to scheduled plant outage start dates. QS Work Instruction QS-20, which provides this guidance, was revised on April 13, 1989.

5. QA will establish formal SSOMI followup assessments to assure potential problems or generic problems are fully evaluated subsequent to the conduct of a SSOMI. QS Work Instruction QS-22 establishing this requirement was issued December 6, 1988. Potential SSFAR problems are required to be investigated for cause determination, generic implications, and corrective actions in accordance with Quality Assurance Procedure (QAP) 18.C.

6. The SSOMI team leader will not be assigned specific design changes for assessment to assure that such design changes get the full attention of a team member (in order to increase the team leader's ability to observe installation activities). This will also assure that the team leader may fully devote his attention to the overall SSOMI process and potential problem areas. QS Work Instruction QS-20 was revised to reflect this change on April 13, 1989.

It is further noted in Section 4.A of the Inspection Report that a generic weakness may exist in the scope and emphasis of PG&E's SSOMI program relative to addressing design changes which are categorized as "Spare Parts Replacement." On the contrary, the SSOMI program is intended to address "Spare Parts Replacement" design changes. For example, the PG&E SSOMI scope during the Unit 2 second refueling outage did include an assessment of a "Spare Parts Replacement" design change, wherein the core exit thermocouple nozzle assemblies design change was fully evaluated.

In addition, as noted in Section 3 of the Inspection Report, the NRC identified problems in the GE/GW vent modification that the PG&E SSOMI Team should have discovered. As discussed in Enclosure 2 of this letter, the GE/GW ventilation modification partial closure deficiency was identified by the PG&E SSOMI Team prior to the NRC Special Inspection. During the time of the NRC inspection, issues associated with this installation were being pursued by the PG&E SSOMI Team and were documented on various Action Requests, Quality Evaluations, and on a Nonconformance Report.

With regard to the ASW pump impeller replacements (which was the design change cited by the NRC as their basis for concluding a generic weakness may exist) and the SI pump replacement design changes, the PG&E SSOMI team intentionally limited their evaluation to specific procurement issues. As a result of evaluating the SSOMI results of eight design change packages selected for the Unit 2 refueling outage, a procurement concern was identified. In the pursuit of this concern, the scope of the SSOMI effort was expanded while the outage was in progress to include the procurement aspects of the ASW pump impeller replacement and the SI pump replacement. This scope expansion resulted in two significant findings: (a) 10 CFR 21 notification on the ASW pump impeller supplier, and (b) a weight discrepancy between the SI pump drawing and the as-built condition.

PG&E's responses to each of the NRC conclusions follow:

NRC Conclusion No. 1

> "Your SSFAR teams did not perform comprehensive technical evaluations. The focus of the first SSFAR inspections appeared to be focused on administrative verification instead of the type of inspection which emphasizes technical aspects."

PG&E Response

As noted in the above introduction, PG&E has not conducted an SSFAR until after completion of the NRC Special Inspection. Thus, the NRC had evaluated PG&E's system audits, which were a transitional step in progressing from the conventional compliance-oriented audit to the comprehensive, technical SSFARs. PG&E concurs with the NRC that the system audits were not comprehensive, technical evaluations. This recognition of the system audit shortcomings developed as follows.

In early 1988, after reviewing NRC SSFI reports and industry experience, and after PG&E's first attempts at this NRC-type activity, PG&E realized that the technical experience of the team members and the depth of pursuit regarding technical issues needed to be improved so that these activities would be fully effective. The first system audit on the auxiliary saltwater system was PG&E's initial attempt to develop the performance-based audit technique and to involve personnel from the technical departments. Furthermore, PG&E recognized that these first attempts were necessarily encumbered by focusing on compliance issues, rather than on performance-oriented issues.

At that time, PG&E developed a management white paper describing the intent to develop a formal SSFAR process. The paper addressed the technical shortcomings of PG&E's earlier systems audits by proposing some form of "look-back" to provide the evaluative confidence that the new SSFAR process would provide for subsequent performance-based system reviews. This paper was presented by PG&E to the NRC in April 1988. Additionally, during the course of the January 1989 NRC inspection, PG&E's staff met with the NRC team members and reiterated this earlier change in approach.

As PG&E completed its planned transition from conventional compliance audits, SSFARs replaced the system audits. The SSFARs are comprehensive, performance-based, technical evaluations that utilize a team of technical specialists with expertise that covers design, operations, maintenance, testing, and quality assurance. The focus of the SSFAR teams is evaluation of the operational readiness of the system being reviewed. The first PG&E SSFAR was performed from February 26 through April 7, 1989. The associated report will be issued in May 1989. PG&E is confident that the NRC, upon review of this report, will conclude that PG&E's SSARs are comprehensive, technical evaluations.

NRC Conclusion No. 2

"The composition of your SSFAR and SSOMI inspection teams did not include sufficient numbers of personnel with the expertise/background to question engineering activities and calculations. When personnel with the expertise to question engineering activities or calculations were assigned to the inspection teams, they were placed in a position of questioning their immediate supervisors or other personnel who have authority over that person."

PG&E Response

PG&E concurs that the system audit teams did not include sufficient personnel with the expertise to question engineering activities and calculations. As discussed in the response to Conclusion No. 1, PG&E's SSFAR program as defined in QAP-18.C resolves this concern.

The first SSFAR (125 VDC, 480 VAC, 120 VAC, and selected aspects of the diesel generators and the 4160 volt systems) was design-driven by utilizing a mix of two PG&E design engineers who had intimate familiarity with DCPP electrical systems, together with three consultant design engineers representing over 45 man-years of industry and AE experience.

During the first SSOMI, QA supplemented the team with an engineering consultant during examination of the Unit 1 pressurizer spray valve qualification calculations.

PG&E recognizes that the effectiveness of SSFAR and SSOMI processes are directly tied to team composition, qualification, and objectivity. PG&E will assure that sufficient technical personnel are included on future SSFAR/SSOMI inspection teams to provide an adequate review. However, PG&E plans to continue to assign these people from within its organization to the maximum extent practical, rather than relying primarily on contractors. PG&E also will assure that personnel have sufficient objectivity and "distance" from the topic being reviewed. PG&E believes this policy is entirely consistent with, and in fact is an enhancement of, its efforts to assure an open, self-critical organization.

NRC Conclusion No. 3

> "The teams begin the inspection with the assumption that the present design is adequate and that design documents, FSAR commitments, and procedures, do not have to be reviewed or questioned. This philosophy unnecessarily limits the depth and scope of your inspection and is not consistent with a high degree of self-criticism."

PG&E Response

The NRC Inspection Report states the initial premise of PG&E's SSFAR is that the design is adequate, and that design documents, commitments and procedures need not be reviewed or questioned. PG&E is aware that the starting point of an NRC SSFI is the original design bases. Diablo Canyon is a unique facility in that there was a thorough independent verification of the plant design basis performed just prior to startup. Most plants have not undergone such a review.

PG&E's position is that the starting point of its SSFAR is the design as verified by PG&E's Design Verification Program (DVP) and the Independent Design Verification Program (IDVP) that were accepted by the NRC. PG&E, therefore, made the decision to deviate from the NRC methodology based on the previous verification program and the NRC's expressed confidence regarding the DVP and IDVP efforts.

In cases where the original design was not addressed in the verification programs, the intent of PG&E's SSFAR program is to reassess it. Further, should any aspect of the DVP be brought to question, the SSFAR process may re-assess the original design to provide reconciliation. PG&E believes this approach provides reasonable assurance that the original design, as modified to its current status, is adequate and consistent with the licensing bases for the plant.

The first SSFAR team focused on industry standards of excellence on the specifics of DCPP electrical system design in addition to its compliance with original design criteria. The team performed extensive technical evaluations of design documents, FSAR commitments, and procedures which resulted in a number of questions. PG&E believes that the first SSFAR was in-depth and self-critical.

It should be noted that the SSOMIs, which involve review of design changes that have been made since the IDVP was conducted, do review the adequacy of the design basis of the design change.

In addition to the above, as part of preparation of revised Design Criteria Memoranda to include extensive design basis information, the basic design of each system is being reviewed for reasonableness. Further, as part of our routine management oversight program, the basic design of selected systems is

being reviewed, primarily to incorporate lessons-learned from the early years of operation. This effort also contributes to the initiatives to build a better bridge between Engineering and Operations. The review of four systems will be completed in the third quarter of 1989. At that time, PG&E will evaluate the need to select other systems vis-a-vis ongoing system reviews. In summary, there are numerous efforts that have been, and are being taken, to assure the basic design adequacy of the plant.

NRC Conclusion No. 4

"Although your inspections did identify significant problems in their later SSFAR inspections, your teams did not take the problems down to the source or root cause, nor did they consider the problems for generic implications, i.e., how many other systems can have this same or similar problems."

PG&E Response

PG&E recognizes the importance of adequate self-identification of problems and effective and timely corrective action. QA, along with the audited organization, plays a major role. While PG&E is committed to and is continuously looking for improved methods to investigate significant conditions adverse to quality to assess the root causes and to determine the corrective actions required to prevent recurrence of the same or similar conditions, it agrees that its system audit teams had not yet been fully effective in researching problems to their source or fully considering identified problems for generic implications. As stated in its response to Conclusion No. 1, PG&E has corrected this situation in the SSFAR process by requiring the SSFAR team to be comprised of sufficient technical specialists.

A training film on the SSFAR and SSOMI processes has been developed and is being used to help orient teams to the processes, the need for objectivity, and the need to pursue the root causes and generic implications of detected problems.

The first SSFAR integrated about 15 man-years of regulatory insight and expertise through three members with previous NRC experience thus assuring proper classification, pursuit, and generic evaluation of SSFAR concerns. In addition, all three QA members on the SSFAR team had received formal root cause training prior to the first SSFAR.

As the SSFAR process is perfected, and the number of performed SSFARs increases, PG&E is confident that there will be adequate technical pursuit of issues as well as the identification of generic considerations.

Although the responsibility for investigating audit findings to identify the root cause and determine the extent of required corrective action lies with management of the audited organizations, Quality Assurance acknowledges its responsibility for the acceptance of those determinations. Depending upon the perceived safety significance and the strength of generic implications, Quality Assurance may exercise its option, as it has in the past, to perform special audits to verify the extent of generic concerns or the adequacy of corrective actions. Based on the anticipated number of SSFARs and the additional stated actions, PG&E is confident that the self-initiated SSFAR process will be an increasingly effective tool to assure that DCPP continues to be maintained and operated in a safe and reliable manner.

Although NRC Conclusion No. 4 is specifically directed toward the SSFAR process, PG&E is also addressing this comment as part of the SSOMI process. The SSOMI process has progressed from the first SSOMI. During the second SSOMI, the Team continued to investigate several issues that were perceived to be potential problems during the earlier effort. PG&E efforts have improved as the SSOMI process evolved. To place additional emphasis in this area, the second SSOMI team participated in a special eight-hour training course on February 9, 1989, on the subject of Root Cause Analysis to specifically address the NRC Team's comment. In addition, PG&E is developing a corporate level QA procedure on the SSOMI process that will include a specific emphasis in this area as part of the overall SSOMI process. Further, as discussed earlier, Quality Support developed specific instructions in Work Instruction QS-22 requiring the conduct of a special follow-up assessment. This will provide an additional mechanism to assure that problem areas and potential problem areas are fully pursued and addressed.