INSPECTION OF SELF-ASSESSMENT PROGRAMS
DIABLO CANYON NUCLEAR POWER STATION

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DIABLO CANYON NUCLEAR POWER STATION
Location: San Luis Obispo, CA
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1.0 Introduction

As part of the ongoing effort to review the operation of Pacific Gas & Electric's (PG&E's) Diablo Canyon Nuclear Power Station (DCPP), the NRC conducted an inspection and evaluated the licensee's self-assessment capabilities. This inspection was conducted using NRC Inspection Module 40500. Two INEL engineers performed two, 2-week inspections (March 6-17 and April 3-14, 1989). The INEL engineers evaluated the licensee's self-assessment capability as related to the electrical instrumentation and control (EIC) areas.

The objectives of the Diablo Canyon inspection were as follows:

- Evaluate the resolution of EIC nonconformance problems and determine (1) if the technical solution was correct, (2) if the proposed action would prevent future occurrences, and (3) if potential problems could have been prevented had the responsible plant organizations identified them and proposed corrective action prior to their occurrence.

- Evaluate the licensee's self-assessment process and determine if it successfully contributed to the prevention of problems and their recurrence.

- Evaluate the licensee organizations responsible for the review and overview of identified corrective actions and determine whether these organizations provided meaningful oversight/input or provided only cursory reviews.

The inspectors found that Diablo Canyon had adequate plant procedures, technical specifications, and Final Safety Analysis Report requirements in place for the self-assessment of plant operation and safety. The required self-assessment organizations were adequately staffed and the requirements were, in general, being met. However the inspectors found that since 1987 Diablo Canyon has experienced continuing problems in adequately determining the root cause of nonconformances, including the determination of required corrective actions and in completing the corrective actions in a timely manner. These problems were recognized by the Diablo Canyon self-assessment organizations and management, and in 1989, a significant effort is being made to correct these problems. The inspectors also found that, in some cases, responsible organizations had not been totally responsive to self-assessment organizations in correcting all identified problems. Therefore, it is the judgement of the inspectors that the self-assessment program is marginally satisfactory.

Evaluation

The inspectors performed a detailed review of selected nonconformance reports (NCRs) and interviewed Technical Review Group (TRG) members and other DCPP personnel responsible for determining EIC problem root causes and developing corrective actions. The inspectors also reviewed NRC, PG&E, and other documents, and attended self-assessment organization meetings to determine whether the the licensee's self-assessment programs contributed to the prevention of future problems.

The status of all 1988 NCRs and Audit Finding Reports (AFRs) was evaluated to determine the timeliness of the completion of corrective actions. In addition, the inspectors reviewed audit reports, special reports, meeting notes, and other documentation prepared by the Quality Assurance (QA) organization, the General Office Nuclear Plant Review and Audit Committee (GONPRAC), the Plant Safety Review Committee (PSRC), and the On-site Review Group (OSRG) from January 1988 to the present. Plant procedures, Technical Specifications, and Final Safety Analysis Report (FSAR) sections applicable to the licensees' self-assessment program were also reviewed.

a. NCR Review

The inspectors performed a detailed review of 26 nonconformance reports (NCRs) related to electrical, instrumentation, and control systems. The reviews included an evaluation of (1) TRG meeting minutes, (2) NCR packages, and (3) interviews with TRG chairmen and other DCPP personnel, as appropriate.

The inspectors' general appraisal of each NCR is included in Appendix A of this report. A summary of the inspectors' findings on these NCRs is provided below.

1. Inadequate Root Cause Analysis or Corrective Action

- The TRG proposed inadequate corrective actions for NCRs DCO-88-TN-N032, DC2-88-TI-N019, and DC1-88-TN-N023.

- Three NCRs (DC1-88-OP-N128, DC1-88-TN-N023, and DC2-38-TI-N093) were issued as a result of inadequate corrective action proposed by TRGs on prior NCRs.

2. Timeliness

- Failure to complete the recommended corrective action for an NCR (DC1-89-TI-N039) in a timely manner resulted in another problem that required an additional nonconformance report to be issued.

3. Other

- One NCR (DC2-88-EM-N076) dealing with a crushed motor lead on a valve operator did not contain an analysis as to the effect of the nonconformance on environmental qualification of the equipment involved during the period that the wire was crushed.

- Two NCRs (DCI 88-TI-N078 and DCI-88-N126) were issued as a result of personnel error (i.e., working on the wrong unit/channel).

In addition to the general review, the inspectors reviewed 10 of the 26 NCRs to determine the basis for delays. The ten NCRs were all over 120 days old with an average age of 278 days, and had no apparent reason for the long delay in their completion.

Based on written information provided by the Regulatory Compliance group and interviews with DCPP personnel, the inspectors determined that the principal causes of delays in completing NCRs were (1) the amount of time required to complete procedures using normal methods and (2) the prioritization of work by organizations.

In addition, two NCRs had been delayed because of initial inadequate root cause determination/corrective actions, and one additional NCR required extensive work prior to closeout. Also, one NCR had been recently closed out, and another NCR was awaiting the next plant outage.

b. Technical Review Groups (TRGs)

As specified in PG&E procedures, NPAP C-12/NPG-7.1 and NPAP C-23/NPG-7.6, TRGs are formed for each identified nonconformance problem with the chairman and members selected by the manager responsible in the area of nonconformance. Each TRG is responsible for determining the root cause of the nonconformance, the immediate actions and other corrective actions to prevent recurrence of the nonconformance. Individual action requests (ARs) are prepared to track the completion of each separate NCR corrective action. The TRG chairman is responsible for obtaining the commitment of responsible departments and scheduling the completion of all ARs. In addition, all schedule revisions must be approved by the TRGs and the TRG chairman is responsible to close out each NCR.

To determine the effectiveness of the TRGs, the inspectors evaluated TRG performance on two specific issues: (1) root cause analysis, including adequacy of corrections; and (2) the timeliness of completing corrective actions.

Based on the two issues identified above, the inspectors reviewed 26 NCRs and related documents, attended two TRG meetings, conducted interviews with licensee personnel, and examined selected records in order to determine the effectiveness of the TRGs. The results of the inspectors' evaluation are provided below.

1. Root Cause Analysis

o TRGs do not always comply with procedural requirements. TRGs are required by NPAP C-23/NPG-7.6 (Section 5.2.5) to complete the root cause analysis using the Human Performance Evaluation System (HPES) methodology. As a minimum, the TRG chairman is required by Section 4.7.4 to prepare Attachment 8.1, "Problem Root Cause Identification," prior to the working meeting. During the two TRG meetings attended by the inspectors, Attachment 8.1 had not been prepared by the TRG chairman. Later discussions with the TRG chairman indicated that he was unaware of this requirement.

The Onsite Review Group (OSRG) has recognized the TRG's failure to adhere to these procedures. In the "Fourth Quarter 1988 OSRG NCR Trend Analysis and TRG Critique Summary," the OSRG attributes TRG's failure to comply with these requirements as a factor in TRG's poor identification of root causes.

o Both the OSRG and the NRC determined that inadequate root cause analysis was an ongoing problem as early as 1987. In order to improve this process, in 1988 all TRG chairman were required to have training in root cause analysis. In addition, the OSRG was asked to critique each TRG and present its findings to the responsible TRG chairman and the GONPRAC.

The inspector's review of 26 NCRs revealed that three NCRs (DCO-88-TN-N032, DC2-88-T1-N019, and DC1-88-TN-N023) proposed inadequate corrective actions resulting in additional nonconformances. In addition, NCR (DC1-88-OP-N128) was the result of inadequate corrective actions proposed by previous NCRs (DC1-87-066 and DC1-87-100). One other NCR, DC-88-TN-N032, proposed a corrective action that did not work and modification was required in the field to meet test requirements.

The review of the OSRG monthly meeting notes and the quarterly trend analyses and critique summaries showed a significant number of inadequate root cause analyses being prepared by the TRGs. The OSRG Quarterly Trend Analysis and TRG Critique Summary discloses that in the third quarter 25% of the TRGs had prepared inadequate root cause analyses. In the fourth quarter, The OSRG judged 24% of the root cause analyses inadequate.

PG&E recognizes that the root cause analysis problem has not been solved by previous corrective actions. Therefore, in an effort to improve TRG preparation of root cause analyses, PG&E has recently begun developing a new procedure, NPAP C-26/NPG-7.9, "Root Cause Analysis." This procedure was based on INPO's "Root Cause Evaluation of Human Performance Events" (Good Practice OE-904, December 1986) and on material prepared by Dr. Chong Chiu of Failure Prevention, Inc. All TRG chairmen are also attending or scheduled to attend training sessions given by Dr. Chiu, a noted expert in this area. The first session was completed in April 1988. Two additional sessions are planned for 1989.

During the March 16, 1988, meeting, General Office Quality Control informed GONPRAC that a task force had been formed to review the draft procedure on root cause analysis methodology.

GONPRAC requested that the task force review the entire root cause analysis process and make improvement commendations where applicable. GONPRAC is holding this review as an open item.

2. Timeliness

The NPG has established a goal of maintaining the average age of NCRs at less than 120 days. The inspectors evaluated the status of all NCRs initiated in 1988 in the light of DCPP's objective of keeping the average age of the NCRs to less than 120 days. As of March 1, 1988, 92 (58%) of the 158 NCRs initiated in 1988 were still open; of these, 71 (45%) were over 120 days old.

The TRGs (with the concurrence of the manager responsible for the individual corrective actions) determine the actual schedule. Changes to the schedule must be approved by the TRG. The TRG chairman is responsible for the closeout of the NCR. A summary of the inspector's findings on the timeliness of NCR completion follows.

- The initial TRG schedules had little meaning and the TRG chairmen have not been forceful in requiring adequate justification to support schedule changes.

- The initial TRG schedules were not followed in any of the 10 long-term NCRs review by the inspectors.

c. Plant Staff Review Committee (PSRC)

The PSRC reports to the Vice President, Nuclear Power Generation (NPG), and is responsible for advising the Plant Manager on matters related to nuclear safety. The PSRC is responsible for providing timely, continuing monitoring of operating activities to keep the Plant Manager aware of

general plant conditions and to verify that day-to-day operating activities are conducted safely and in accordance with applicable administrative controls.

To evaluate the effectiveness of the PSRC, the inspectors evaluated the committee's actions to determine if they performed the required functions in accordance with Technical Specifications, FSAR, and PG&E procedure requirements and if their actions were effective.

During the inspection, PSRC meetings notes and other documents were reviewed, a joint GONPRAC-PSRC meeting was attended, and interviews were conducted with DCPP personnel. A summary of the inspectors findings on the PSRC follows.

- o The PSRC is complying with all FSAR Technical Specification and procedural requirements and, in general, contributes to the safe operation of the plant.

- o The inspectors determined that the PSRC has not been effective in obtaining DCPP action to reduce the average age of NCRs to less than 120 days or in meeting DCPP's November 1988 commitment to GONPRAC to complete the majority of the 37 non-outage-related 1988 NCRs before the end of 1988. (The commitments were made during a joint GONPRAC-PSRC meeting on November 10, 1988.) The PSRC began a monthly review of the status of all open NCRs in January 1989. However, these monthly meetings had little impact on reducing the age of NCRs or completing the DCPP commitment to GONPRAC. As of March 27, 1989, 22 of the 37 NPG non-outage-related 1988 NCRs were still open.

d. Onsite Site Review Group (OSRG)

The OSRG reports to the Manager, Nuclear Operations Support (NOS). This group is responsible for reviewing unit operating characteristics, NRC

issuances, industry advisories, Licensee Event Reports, and other sources of plant design and operating experience information to identify areas of plant safety that may need improvement. This group is also responsible for making recommendations to GONPRAC and the Vice President, Nuclear Power Generation (NPG).

- The inspectors found that the OSRG is multidisciplinary and its members have adequate qualifications and experience to satisfactorily fulfill the requirements of the TMI Action Plan, Item I.B.1.2 (i.e., to establish an independent safety review group).

- The inspectors found that the OSRG had generally reviewed available information and made detailed recommendations to improve plant safety in a number of areas. For example, the OSRG transmitted a report entitled, "OSRG Independent Assessment of 10 CFR 21, Reportability for Rosemount Model 1153, Series D Differential Pressure Transmitters (Letter No. 88000389)," to B. R. Giffin on May 25, 1988. This OSRG report was generated as a result of its disagreement with the findings of the Nuclear Engineering and Construction Services (NECS) evaluation on the 10 CFR 21 reportability requirements for Rosemount pressure transmitter problems.

  The OSRG recommended, with Mr. Giffin's concurrence, that (1) the OSRG report should be transmitted to the General Office Review Group (GORG) for their evaluation of the 10 CFR 21 reportability of the subject transmitters problems; (2) a detailed instruction should be written to provide the necessary guidance for, and to ensure consistency of, all PG&E 10 CFR 21 evaluations; (3) based on previous regulatory involvement with 10 CFR 21 evaluations, James D. Woessner of Nuclear Administrative Support Services should be included in the review/acceptance process for all 10 CFR 21 evaluations to be performed prior to the issuance of

the above detailed instruction; and (4) NECS engineering review the present and future applications of these transmitters at DCPP. All of the above actions except (4), which is not applicable at this time, are complete.

During interviews with the OSRG chairman, the inspectors determined that approximately 25% of the OSRG staff effort is spent attending TRG meetings, critiquing the TRGs actions, and resolving differences between the TRGs and OSRG. These efforts, which are directed toward ensuring correct resolution of NCRs, are at the request of GONPRAC and the Vice President, Nuclear Power Generation. However, the inspectors judge this additional effort reduces the amount of time spent on general plant review and on the improving plant performance.

During the April 13, 1989, joint meeting of GONPRAC and PSRC, the Vice President, Nuclear Power Generation, emphasized that the OSRG was the final judge of the adequacy of the TRG root cause analysis and that the OSRG should continue its detailed review of each TRG finding.

e. General Office Nuclear Plant Review and Audit Committee (GONPRAC)

The GONPRAC reports to the President, PG&E. GONPRAC is responsible for providing independent review and audit of activities related to the DCPP overall plant performance.

To determine the effectiveness of GONPRAC, the inspectors (1) reviewed the 1988 GONPRAC meeting notes and other related documents, (2) attended a joint GONPRAC-PSRC meeting, (3) conducted interviews with licensee personnel, and (4) examined selected records. Specific documents reviewed included the DCPP Final Safety Analysis Report (FSAR), Technical Specifications and NPG Procedures, and the meeting notes for GONPRAC, PSRC, and OSRG meetings. A summary of the inspector's findings on the GONPRAC follows.

- o GONPRAC complies with all FSAR, Technical Specification, and NPG procedural requirements. The inspectors determined that GONPRAC satisfactorily monitors the overall performance of the plant and adequately focuses its efforts on performance improvements. This committee receives input from other PG&E assessment groups and obtains special studies, as necessary, to evaluate and improve plant performance.

- o GONPRAC has not been effective in reducing the average open time of NCRs to less than 120 days. In November 1988, GONPRAC reviewed the status of 76 NCRs that had been open longer than 120 days. Commitments were made by NPG managers to close the majority of these NCRs by the end of 1988; However, on March 27, 1989, 37 NCRs remained open. On March 27, 1989, Mr. J. D. Shifer, Vice President, NPG prepared a memorandum to NPG on "NCR Closure Performance," in which he stated that failure to close these NCRs represented a failure to follow through on commitments made to GONPRAC.

  In its March 10, 1989 meeting, GONPRAC recognized that it needs to improve its effectiveness. A subcommittee was formed to investigate ways for improvement. The subcommittee was also asked to examine GONPRAC's continuing reviews of the open NCRs. The subcommittee investigation was not completed prior to the completion of this inspection.

f. Quality Assurance (QA)

The Manager, QA, is responsible to the President, PG&E for managing the QA Program and for assuring that the QA Program prescribed by the QA Manual is implemented and that all involved organizations, both internal and external to PG&E, comply with it.

To determine the effectiveness of QA, the inspectors reviewed the status of all Audit Finding Reports (AFRs) issued in 1988, reviewed two program audits, reviewed one technical audit, and interviewed QA personnel.

The inspectors believe that the AFRs have not been closed in a timely manner. The 1988 AFR status was examined in light of GONPRAC's recommendation that the average age of AFRs should be less than 120 days. As of March 17, 1989, 17 of the 48 AFRs issued in 1988 were still open; 15 of these were over 180 days old. Various reasons were given for the longevity of the issued ARs. However, since none of the corrections required an outage or the purchase of material, the inspectors believe that this extended time to complete the recommendations is excessive.

Based on a review of the QA 1988 program and technical audits, the inspectors believe that the technical audits, such as the 4160 Volt System Audit (88803T), contribute the most significant and useful information. A similar audit will be completed in 1989 for safety-related 125 VDC, 480 VAC, 120 VAC and selected aspects of the diesel generator and 4160 V systems. This audit will evaluate the adequacy of testing, maintenance, training operations, and other DCPP programs.

The inspectors believe that the program audits are not as comprehensive as the technical audits. For example, the timeliness of NCR completions was identified as a "quality concern" in June 1987 (Ref. 18). QA audit 88601P, "Results of Corrective Actions for Deficiencies in Plant Equipment, Structures, Systems, or Methods of Operation Affecting Nuclear Safety," found no problems in the timeliness of NCR completions, although the average age of NCRs has not been reduced since 1987. In addition, the adequacy of TRG root cause analyses was not discussed even though the NRC, GONPRAC, and the OSRG had identified it in 1987 as a plant concern.

g. Other Concerns

During the review of 26 NCRs, the inspectors determined that on two separate occasions the same event was caused by personnel working on the wrong instrument channel (DC1-88-TI-N078 and DC1-88-TI-N126). A review of NCRs and trend data indicated that this has been a root cause of numerous nonconformances since 1987.

This problem was discussed with the OSRG chairman, who believes that a change made in the DCPP work orders would improve this situation. Revisions to all plant work orders include the requirement that the worker answer questions regarding the specific unit and channel being worked on. This was confirmed by the inspectors. Since this change has been implemented, the number of events caused by work on the wrong unit/channel has dropped from three cases in the third quarter of 1988 to zero in the fourth quarter.

h. Industry Experience

In 1988, both NRC and industry evaluations noted that PG&E had not effectively used industry operating experience to prevent a number of similar events from occurring at Diablo Canyon. In response to this concern, PG&E (NOS-OEA) instituted actions to (1) issue a monthly status report on in-house and industry experience activities, (2) establish a priority system to assure that key items were identified and tracked, and (3) add important items to the weekly NPG managers meeting. In addition, the NCR process was revised to require specific consideration of appropriate industry operating experience, including information from the Nuclear Plant Reliability Data System (NPRDS). The Operating Experience Assessment (OEA) group, which is located in San Francisco, is responsible for gathering, evaluating, and communicating information regarding industry experience within PG&E. The inspectors were unable to determine the success of this program.

3.0 Conclusions

During the inspection, the inspectors reviewed numerous documents, attended two TRG meetings and one joint GONPRAC-PRSC meeting, and interviewed plant personnel. The inspectors found that, despite the problems identified in this report, overall the Diablo Canyon Self-Assessment Program is marginally satisfactory. This is principally due to the corrective measure instituted following the 1988 audit and increased management attention. The DCPP staff and organizations involved in the program appeared to have adequate knowledge, experience, and authority to perform assigned program functions. Procedures and guidelines were in place which should allow DCPP to identify, correct, and/or prevent safety-significant technical problems and deficiencies from occurring. However, the program continues to need strong management support and attention.

The inspectors determined that, in general, the self-assessment organizations at Diablo Canyon effectively used internally generated trending information, NRC information, industry experience, and other performance data when making decisions and recommendations. However, the inspectors found that the self-assessment programs were overbalanced in the areas of problem correction, rather than problem prevention. The inspectors attributed this weakness to PG&E's failure to resolve two long-term systematic problems (i.e., root cause analysis and the timely disposition of corrective actions). All of the self-assessment organizations continued to devote large amounts of time and effort to resolve issues that should already have been resolved by other groups or committees. This additional effort had reduced the overall effectiveness of the DCPP self-assessment programs.

The inspectors identified the following program weaknesses and recommend that DCPP improve their program in these areas.

1. Diablo Canyon has been slow in resolving identified systematic problems with the resolution of nonconformances. This is evidenced by the licensee's slowness in resolving the problems with the performance of root cause analysis and the completion of actions to resolve/prevent nonconformance in a timely manner. Both of these items were identified by Diablo Canyon self-assessment groups as needing improvement in 1987. However, during the inspection it was found that 6 of the 26 NCRs reviewed either were the result of previous inadequate root cause analysis or had inadequate root cause analysis performed by the respective TRGs. In addition the OSRG identified 24% of the root cause analyses performed in the fourth quarter of 1988 to be inadequate. The timeliness of the completion of NCRs was identified by Quality Support as a safety concern in 1987. In 1988, the Diablo Canyon management established a goal of maintaining the average of all NCRs below 120 days. During their overall review of 1988 NCRs, the inspectors determined that 58% of NCRs issued in 1988 were still open on March 1, 1989.

2. The Diablo Canyon organizations do not always give high priority to problems identified by self-assessments groups. The inspectors base this finding on the failure of responsible organizations to improve on the timeliness of the completion of NCRs in light of Quality Support's identification of this issue as a safety concern in 1987 and GONPRAC's 1988 goal of maintaining the average age of all NCRs below 120 days. It also should be noted that J. D. Shiffer, Vice President, NPG, stated in the April 13, 1989 joint GONPRAC/PSRC/OSRG meeting that responsible organizations had failed to meet commitments made to GONPRAC, since they had not completed the majority of 76 long term open NCRs by the end of 1988.

4.0 Persons Contacted

The inspectors interviewed TRG, PSRC, the OSRG, and GONPRAC members, as well as QA Department and other plant personnel. The investigators attended two TRG meetings and one joint meeting of GONPRAC, PSRC and OSRG. A list of the personnel contacted by the inspectors is provided below.

W. J. Kelly	PTRC	Power Production Engineer
T. L. Grebel	PTRC	Reg. Comp. Supervisor
D. L. Bauer	PGMT	Sr. Power Production Engineer
W. T. Rapp	NOSR	Chairman, OSRG
J. M. Rappa	PGMT	Gen. Maintenance Foreman
M. W. Stephens	PGIS	Sr. I & C Supervisor
C. F. Synder	QAQS	QS Analyst
K. M. Tama	PQCE	QC Specialist
S. Chen	NECS	Electrical Engineer
B. Smith	NECS	Electrical Engineer
D. Streebel	NCEE	Electrical Lead Engineer
J. M. Gisclon	PAMT	Assistant Plant Manager
C. L. Eldgridge	PQCT	QC Manager
W. H. Fujmoto	NOS	Manager
D. L. Taggart	QAQS	Director Quality Sup.
J. R. Harris	QA	Supervisor
P. E. Beckman	NOS	Sr. Nuclear Engineer

REFERENCE DOCUMENTS

Procedures

1. DCPP Quality Assurance Procedure QAP-15.B, "Nonconformances," dated May 1, 1988.

2. DCPP Nuclear Plant Administrative Procedure NCAP C-23/NPG7.6, "Technical Review Groups," Revision 1, dated August 1, 1988.

3. DCPP Nuclear Plant Administrative Procedure NCAP C-12/NPG 7.1, "Identification and Resolution of Problems and Nonconformances," Revision 15, dated November 15, 1988.

4. DCPP Administrative Procedure AP E-4S4, "Issuance and Approval of On-The-Spot Changes to Procedures," Revision 15, dated January 23, 1989.

OSRG-Related Documents

5. Memoranda, W. T. Rapp (Chairman OSRG) to W. H. Fujimoto, Subject: Fourth Quarter 1988 OSRG NCR Trend Analysis and TRG Critique Summary (Letter No. 89000242), dated April 11, 1989; Third Quarter 1988 OSRG NCR Trend Analysis and TRG Critique Summary, dated December 7, 1988; Second Quarter 1988 OSRG NCR Trend Analysis and TRG Critique Summary, dated December 6, 1988; and First Quarter 1988 OSRG NCR Trend Analysis and TRG Critique Summary, dated July 12, 1988.

6. Memorandum, J. D. Shiffer (Vice President, NPG) to Distribution, Subject: NCR Closure Performance, dated March 27, 1989.

7. Memorandum, Nuclear Administration and Support Services to Mechanical and Nuclear Engineering, et al., Subject: Final Minutes, General Office Nuclear Plant Review and Audit Committee Regular Meeting, March 16, 1989, Letter No. SIA89042803(2).

8. Memorandum, Nuclear Administration and Support Services to Mechanical and Nuclear Engineering, et al., Subject: Final Minutes, General Office Nuclear Plant Review and Audit Committee Regular Meeting, February 24, 1989, Letter No. SIA89031001(1).

9. Memorandum, Nuclear Administration and Support Services to Distribution, Subject: Final Minutes of a Special Meeting of the General Office Nuclear Plant Review and Audit Committee, including Attachments, dated December 22, 1988.

10. Memorandum, GONPRAC and PSRC Secretaries to GONPRAC/PSRC Members, Subject: Final Minutes: GONPRAC and PSRC Joint Meeting on January 27, 1989, dated February 6, 1989.

OSRG-Related Documents

11. Memorandum, Nuclear Operations Support to W. H. Fujimoto, Subject: Onsite Safety Review Group Review of Contractor Control and Maintenance Practices (Letter No. 89000231), dated March 8, 1989.

12. Memorandum, Nuclear Operations Support (OSRG) to Bryant W. Giffin, Subject: OSRG Independent Assessment of 10CFR21 Reportability for Rosemount Model 1153 Series D Differential Pressure Transmitters (Letter No. 88000389), dated May 25, 1988.

13. Memoranda, Nuclear Operations Support (OSRG) to Distribution, Subject: Summary of ORSG Meeting of 1/26/88, dated February 16, 1988; Summary of OSRG Meeting of 2/17/88, dated March 2, 1988; Summary of OSRG Meeting of 3/7/88, dated March 29, 1988; Summary of OSRG Meeting of 3/30/88, dated April 18, 1988; Summary of OSRG Meeting of 4/20/88, dated May 19, 1988; Summary of OSRG Meeting of 5/17/88, dated June 2, 1988; Summary of OSRG Meeting of 6/21/88, dated August 4, 1988; Summary of OSRG Meeting of 7/19/88, dated August 25, 1988; Summary of OSRG Meeting of 8/16/88, dated September 20, 1988; Summary of OSRG Meeting of 9/13/88, dated October 13, 1988; Summary of OSRG Meeting of 11/1/88 - 11/2/88, dated December 30, 1988; Summary of OSRG Meeting of 11/16/88, dated December 30, 1988; Summary of OSRG Meeting of 12/13/88, dated February 9, 1989.

Miscellaneous

14. Memorandum, J. D. Woessner (PG&E) to Distribution, Subject: Procedure Review and Comment, dated April 6, 1989.

15. Memorandum, Manager Quality Assurance to George A Maneatis, Subject: Diablo Canyon Power Plant (DCPP) Units 1 and 2, Technical Specification Administrative Controls and Provisions of the Operating Licenses, Audit 88832T, dated December 1988.

16. Memorandum, Nuclear Operations Support (P.E. Beckham/W.T. Rapp) to Warren Fujimoto, Subject: In-house and Industry Operating Experience Status Report #3 (Letter No. 89000825), dated April 11, 1989.

17. Memorandum, K. C. Doss (HPES Coordinator) to J. D Townsend, Subject: Human Performance Evaluation System (HPSES) Report 80-033: Generic Evaluation of Wrong Unit/Component Type Events (Letter No. 87001580), dated November 13, 1987.

18. Memorandum, Steven M. Skidmore to Vice President, Nuclear Power Generation, Subject: Quality Assurances Department's Quality Concerns List, dated June 9, 1987.

19. PG&E, Human Performance Evaluation System (HPES) Report 87-035, dated February 12, 1988.

20. Meeting Notes/Attachments, First Quarter 1989 Joint GONPRAC and PSRC Meeting, April 13, 1989.

21. DCPP Work Order C0051725, "Troubleshoot RM-28B," March 31, 1989.

ATTACHMENT A

RESULTS OF REVIEW OF NONCONFORMANCE REPORTS (NCRs)

This attachment contains the inspectors' findings related to the sample of 26 of 158 NCRs, both open and closed, that were selected for review during the onsite inspection at Diablo Canyon.

Closed NCRs

Listed below is a sample of 9 of 158 NCRs that were generated in 1988 and were closed as of March 7, 1989.

1. DCO-88-QA-N003 - 4KV Switch Gear Room Ventilation System

   Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

   DCPP's overall actions to resolve this nonconformance are judged to be adequate.

2. DCO-88-EM-N005 - Reactor Trip Breakers (Seismic Features)

   Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence. However, the inspectors noted that this NCR had not been closed, as stated in DCPP's Closed Report.

DCPP QA Personnel stated the "closed status" had been entered into the PIMS computer system inadvertently. To prevent a recurrence of this situation, a security code will be developed to allow only the proper personnel to enter data in this particular data field. DCPP's overall actions to resolve this nonconformance are judged to be adequate.

3. DC1-88-EM-N011 - Nuclear Instrument IY-13 Inverter

Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

4. DC1-88-TN-N033 - Containment Penetration No. 63 Modifications

Based on their review of this NCR and on conversations with plant personnel, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

5. DC2-88-EM-N076 - Limitorque Valve Operator T2 Motor Lead Crushed

Based on the review of this NCR, the inspectors judged the immediate corrective action, repair and corrective action to prevent recurrence adequate. However the Licensee inappropriately determined that the valve operator had been functional during the period the lead was crushed as they had not considered or documented the functionality, from an E.Q. design basis standpoint.

As stated above, the inspectors believe that the proposed corrective actions are adequate; however the NCR did not address a potential genetic problem (i.e., the TRG's failure to properly address the effects of nonconformance on design requirements). The OSRG also identified this problem.

In "Summary of OSRG Meeting of 11/1/88 - 11/3/88 (Letter No. 88002265), dated December 30,1988, the OSRG expressed the concern that the TRGs do not always adequately evaluate problems or situations affecting design requirements (seismic, EQ, etc.) or programmatic commitments (heavy loads, fire protection, post-LOCA flow path leakage, etc.). The OSRG suggested that an AR field be created to initiate such evaluations; however this suggestion was rejected as unnecessary by the Assistant Plant Manager during an OSRG meeting. The OSRG chairman stated he felt strongly that the evaluations noted above are necessary and he is preparing a letter to the Plant Manager to address this specific problem.

The inspectors strongly agree with the OSRG's action. Without the above evaluation, there is no assurance that this particular valve operator was operable and therefore capable of performing its safety function had it been exposed to its design basis accident environment during the time the lead was crushed.

6. DC1-88-TI-N078 Reactor Trip - Instrument and Control (I&C) Personnel Inadvertently Adjusted the Wrong Protection Set.

This NCR was generated as a result of plant personnel inadvertently adjusting incorrect instrumentation channels or protection sets.

Based on their review of this NCR and on conversations with plant personnel, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

7. DC1-88-WP-N097 - Plant Vent Radiation Monitor RM-29

Based on their review of this NCR and on conversations with plant personnel, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

8. DC1-88-TI-N126 - Maintenance Required on 2 FI-90 was Performed on 1-FI-90 (Wrong Unit)

This NCR was generated as a result of plant personnel inadvertently performing maintenance on the wrong unit.

Based on their review of this NCR and on conversations with plant personnel, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

9. DC1-88-OP-N128 - Containment Vent Isolation Due to Inadvertent Placing of "Pulse Cal" on RM-14B

During the review of this NCR and conversations with plant personnel, there were no exceptions taken on this particular NCR. However, this

exact problem occurred on two other occasions as documented in NCRs DC1-87-OP-066 and DC1-87-OP-100 (dated May 26, 1987 and August 28, 1987, respectively).

The corrective actions to prevent recurrence for NCR DC1-87-OP-N066 were:

1) The operator involved was counseled as to his improper actions.

2) The labeling of the radiation monitoring racks was reviewed and revised to improve human factors.

The corrective actions to prevent recurrence for NCR DC1-87-OP-N100 were:

1) Replace the existing labeling with Red 2" x 3" lamicoid name plates on each rad monitor.

2) Review the event with all operators.

The corrective action to prevent recurrence for DC1-88-OP-N128 were:

1) The design change (DCP-A39771) on the Control Room wall where the radiation monitors are located was completed to prevent further personnel hazards from exposed bolts.

2) Plastic or Plexiglass covers were installed on all radiation monitors on the racks in the Control Room where inadvertent operation could result in an ESF actuation. These covers will enclose the control switches to act as an additional barrier to misoperation.

3) Operating Procedure G-1:II was revised to delete the requirement to perform a "pulse cal" alarm check prior to each radwaste discharge.

4) An Operation Incident Summary was issued on this event, stressing the involvement of distraction and its effect on the self-verification process.

The incorrect corrective actions for the first two NCRs to prevent recurrence in conjunction with the six NCRs addressed in section 2 (Inadequate Root Cause Analysis or Corrective Action) of this report serve as examples of DCPP's inability to assess their problems and to arrive at a positive correction action.

The corrective action to prevent recurrence for DC1-88-OP-N128 is a more positive solution to the recurrence problem and is, therefore, judged adequate.

Open NCRs

Listed below are a sample of 17 NCRs that were generated in 1988 and were still open as of March 7, 1989.

10. DC2-88-TI-N019 - Reactor Trip From Seismic Trip Test

On June 15, 1987, an Action Request (AR) (AR-076267) was initiated recommending more main annunciator alarms on seismic trip sensors (only 3 of 7 relays are monitored). This action would give the operators/technicians indication of relay failures and help prevent inadvertent reactor trips during testing due to failed relays in the opposite channel. This AR was assigned a low priority (7).

On March 3, 1988, a Unit 2 reactor trip occurred during calibration of the seismic trip channels with a failed relay in the opposite channel. The AR, if implemented, would have indicated the failed relay and help prevent the reactor trip. For this NCR (DC2-88-TI-N019), the TRG proposed:

1) Review the possibility of installing more main annunciator alarms on seismic sensors for Unit 2.

2) As an interim correction, require technicians to visually check for failed sensors prior to performing testing.

On September 1, 1988, a second reactor trip occurred on Unit 2. This event was similar to the pervious event on March 3, 1988. NCR DC2-88-TI-N093 resulted.

The inspectors found three deficiencies with the Diablo Canyon handling of this problem. They are:

1. AR-076267, initiated on June 15, 1987, was not reviewed, approved, and implemented in a timely manner causing a seismic trip to occur on March 3, 1988 (NCR DC2-88-TI-N019).

2. The interim corrective action for DC2-88-N019 was not effective and did not prevent a second seismic trip on September 1, 1988 (NCR DC1-TI-N090).

3. The long-term corrective action for DC 2-88-N019 (and AR-076267) were not completed in a timely manner to prevent the second seismic trip.

11. <u>DC1-89-TI-N039 - Rad Monitor Inoperable</u>

Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

This Technical Specification violation would have been prevented had the revised return-to-service procedure (STPI-120B4), revised as a corrective action for DC1-88-TI-N138, been available to the technician. The revised procedure was originally scheduled to be complete on February 6, 1989; however, it was not issued for use until March 18, 1989.

The inspectors noted that 6 days elapsed between management sign-off of the revised procedure and nonconformance problem. The immediate availability of the revised procedures would have prevented the problem. The inspectors did not examine the reason for the delay between procedure sign-off and the procedure being available to the technicians.

12. NCR DCO-88-TN-N052 - Reactor Trip and ESF Response Time Testing

The NCR action stated that the operators are trained to recognize a 1-second energization time delay for the slave relays during reactor trip and ESF time response testing when normal energization time is in the range of 5 to 12 milliseconds. The review of this concern disclosed that the actual operator training includes training on both a 12-millisecond and a 1-second relay energize. This training allows the operator to recognize the time delay difference during relay response testing. The operator is able to recognize the energization both audibly and visually. From the above, it is judged this is a positive and adequate training process and the NCR training action was simply poorly written but properly implemented.

13. DC2-88-EM-N082 - Reactor Trip

Resolution of this NCR involved the review by the TRG and a subsequent review by an Event Inspection Team (EIT). The EIT recommended three

additional corrective actions. These actions were included in a revised NCR issued by the TRG.

Based on their review of the revised NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with the TRG and EIT assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

However, as a result of this NCR, the inspectors have the following concerns:

1) It appears that DCPP personnel are not completely knowledgeable regarding all plant systems. The DCPP personnel were unaware that the multiple 12-kV ground detection alarms were not designed to provide the location of the grounds on the 12-kV system. Corrective action to either disable the unnecessary multiple alarms or install the proper relays to provide selective ground detection should have been accomplished before the event.

2) Nuclear Engineering and Construction Services (NECS) has failed to complete corrective actions in a timely manner. None of the corrective actions assigned to NECS had been completed as of April 14, 1989.

14. <u>DC2-88-TI-N093 - Unit 2 Reactor Trip: Seismic Trip Protection</u>

Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

This NCR is the result of an inadequate immediate (interim) corrective action following the March 3rd reactor trip (see DC2-88-TI-N019).

15. DC2-88-EM-N136 - Instrument Inverter PY-22

Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

DCPP's overall actions to resolve this nonconformance are judged to be adequate.

16. DC1-88-TI-N138 (1RM-12 Inoperable due to improper valve alignment)

Based on their review of this NCR, the inspectors took no exceptions to DCPP's overall assessment. The inspectors concurred with DCPP's assessment of the root cause and with the analysis of the event, the immediate corrective actions, and the corrective actions to prevent recurrence.

However, the resulting corrective action (i.e., to revise return-to-service procedure STPI-120B4) was not completed in a timely manner, which resulted in another nonconformance and a Technical Specification violation. (See DC1-89-TI-N039.)

Long-Term Open NCRs

Ten open NCRs were selected due to their longevity. These NCRs, which were initiated in 1988, were still open on March 7, 1989. There was no

apparent reason for these NCRs not having been closed within 120 days. The inspectors requested that DCPP explain why these NCRs had not been closed. DCPP's responses were then evaluated using plant documents and interviews with plant personnel. The DCPP's responses and the inspector's appraisals are discussed below.

17. DC1-88-TN-N023 Pressurizer Cooldown Rate Exceeded, Open 348 Days as of 3/7/89

DCPP's Response:

This NCR is now closed. Because a similar later event took place on Unit 2, the TRG chairman had kept this NCR open until the Unit 2 event was resolved and corrective actions completed.

Findings:

The inspectors noted that the TRG corrective actions to prevent recurrence of this problem required the revision of OP L-5 to ensure that BIT flow rates do not cause excessive pressurizer cooldown rate. However, a later similar event took place on September 18, 1988, in Unit 2 (NCR-88-TN-N106). The TRG again determined that the root cause was an incorrect procedure, OP L-5, which specified a net charging rate flow based on a calculation which had two inappropriate assumptions. The corrective action to prevent recurrence was again to revise OP L-5.

Although these two events were not identical, both events had the same root cause, incorrect procedure OP L-5. The inspectors judged the corrective actions adequate for each event. However the above reflects as an example of DCPP's

lack of ability to search out potential problems (i.e., had OP L-5 been reviewed in a more rigorous manner after the first event for other potential procedural problems, the second event could possibly have been prevented).

It is also judged that holding NCR DC1-88-TN-N023 open until the Unit 2 event was resolved and corrective action completed was reasonable.

18. DC2-88-TN-N028 - Missing or Broken Hardware on Battery Racks 22 & 23; Open 337 Days as of 3/7/89

DCPP's Response:

All corrective actions have been completed. The NCR was reviewed by the PSRC and approved for closure on Thursday, March 23, 1989. The NCR has been forwarded to QA for verification and closure.

The long-term corrective actions required revisions to NPAP C-12, C-40S3, and the Q-List, which took time due to the changes requiring plant and GO review. In addition, the PSRC determined that additional corrective actions were required, which necessitated that the TRG reconvene, approve new actions, and that these actions be incorporated into the NCR.

Findings:

Regulatory compliance personnel provided a written scenario, Attachment C, explaining the review process for this particular NCR as an example of the lengthy review process NCRs undergo. The inspectors believe that the reasons for the delay in completing this are lack of priority, the

failure of the TRC chairman to push the completion, and the long time required to complete the revision of procedures. The attached scenario also indicates that two TRGs had to be convened to correct the identified problem.

19. DCO-88-TN-N032 Fire Pump Low D/P Open 335 Days as of 3/7/89

DCPP's Response:

All corrective actions have been completed. The NCR was reviewed by the PSRC and approved for closure on Thursday, March 23, 1989.

The TRG's initial corrective action, a replacement of the test flow loop orifice, did not resolve the problem, as the pump did not meet the STP P-7 requirements when tested. Corrective maintenance was performed a second time. The impeller wear rings were replaced and the impeller-to-casing alignment was verified. STP P-7 was successfully performed on September 24, 1988. In mid-December, the OSRG initiated an AR concerning the root cause, and the TRG was reconvened. The root cause is being reinvestigated to resolve the OSRG concerns.

Findings:

As stated above, the TRG's initial determination of root cause and corrective action was incorrect. The longevity of this NCR is primarily due to the inaccurate root cause determination by the TRG as corrective maintenance had to be performed a second time in order to meet the STP P.7 requirements. However, the inspectors judged the followup corrective action is adequate.

20. DCP-88-TI-N050 Reg. Guide 1.97 Violation, Open Days 308 as of 3/7/89

DCPP's Response:

Corrective action for this NCR requires the inclusion of all I&C equipment required by Reg. Guide 1.97 in the preventive maintenance program. The large amount of work involved and the prioritizing of this activity has resulted in the long lifetime of this NCR.

Findings:

The inspectors agree with DCCP's response.

21. DCP-88-TN-N058 Diesel Oil Filter Plugged Due to Biofouling, Open 293 Days as of 3/7/89

DCPP's Response:

One corrective action is still open. This action requires a design change to add a sampling port to the day tanks. This DCN is likely to be implemented during 1R3 or 2R3.

Findings:

The NCR is outage related and its lengthy closure time is understandable.

The longevity of the five following NCRs are due to the long time required in the revisions (See Attachment B) of procedures and for the low priority assigned to the revision.

22. DC2-88-TN-N067 Missed Surveillance on ECCS Venting, Open 273 Days as of 3/7/89

DCPP's Response:

A corrective action for this NCR required that procedure AP-C-379 include a requirement to review the STP overdue list on a weekly basis. This procedure is undergoing a major revision based on commitments on other NCRs. Due to the extent of the changes, the revision and approval is taking a long time.

Based on discussions with DCPP personnel, the Inspector's judge the longevity of this NCR due to manpower prioritization and the time DCPP requires to revise and approve procedures.

23. DC1-88-OP-N074 Steam Line Inadvertently Isolated, Open 245 Days as of 3/7/89

DCPP's Response:

Corrective actions include I&C developing a new procedure to provide guidelines for specific instructions, reviews and approvals for troubleshooting activities. This procedure is still under development.

Based on discussion with DCPP personnel, the inspectors judge the longevity of this NCR to be due to the lack of manpower prioritization.

24. DC2-88-EM-N075 DG 2 Auto Start, Open 245 Days as of 3/7/89

DCPP's Response:

Corrective actions for this NCR included labeling all subject fuses, which DCPP personnel stated took considerable time to

complete. An additional corrective action required the revision of electrical maintenance procedure 63.1A. This procedure revision has recently been completed and will be presented to the PSRC in the next two weeks.

Based on discussion with DCPP personnel, the inspectors judge the longevity of this NCR due to low prioritization.

25. DC1-88-TI-N084 Improper Calibration on OPDT, Open 217 Days as of 3/7/89

DCPP's Response:

Corrective action for the NCR involves revising I&C test procedures where lead/lag modules are affected. The low prioritization of this activity has resulted in the long lifetime of this NCR.

Based on discussion with DCPP personnel, the inspector judged the has not been completed in a timely manner due to its low priority by DCPP. It was not determined why this had received a low priority.

26. DC2-88-TN-N119 Foreign Objects in Core, Open 134 Days as of 3/7/89

DCPP's Response:

The PSRC determined that the TRG corrective action requiring the review of the videotape of the core internals prior to closure of the reactor head needs to be proceduralized. The NCR was revised to incorporate this new corrective action, and the procedure is scheduled for PSRC review on April 1, 1989. The delay in completing this procedure is satisfactory since it will not be required until October 1989 (refueling).

ATTACHMENT B

REVISE A PROCEDURE

1.	Obtain copy of procedure. Mark up procedure with revisions and send to word processing.	1 week
2.	Word processing types your draft.	1 week
3.	You review typed version, notice mistakes and further information needed. Mark up.	1 week
4.	Word processing types your draft.	1 week
5.	Typed version okay. Copies made, send to security, 2C, 2A, Engineering, Operations, Reg. Compliance for comment.	3 weeks
6.	Comments returned, procedure revised by word processing.	1 week
7.	Final signoff copy routed for approval to security 2C, 2A Engineering Operations Reg. Compliance. Some departments have more comments. Procedure needs revising.	4 weeks
8.	Back to word processing.	1 week
9.	Procedure out for final signoff.	2 weeks
10.	Procedure ready for PSRC review. Next PSRC is 2 weeks away.	2 weeks
11.	PSRC reviews and rejects your procedure; comments incorporated, send to word processing.	1 week
12.	Up for PSRC review again. Next meeting in 1 week.	1 week
13.	Procedure approved.	
		19 weeks
		133 days

ATTACHMENT C

NCR DC2-88-TN-N028

04/04/88	NCR initiated.
04/15/88	1st Technical Review Group (TRG).
05/23/88	2nd TRG - Corrective actions include restoring battery racks to normal configuration, investigating if revisions to NPAP C-12 and C-4053 are warranted.
06/14/88	Battery racks restored to normal configuration.
08/10/88	AR evaluation written to revise STP M-11C, AP C-12.
09/30/88	STP M-11C in approval cycle, evaluation written to revise AP C-4053 and Q-list.
10/17/88	3rd TRG - Corrective actions to revise procedures added to NCR.
11/88	Q - list revised.
11/16/88	AP C-12 approved by PSRC.
12/08/88	AP C-40 53 approved by PSRC.
01/19/89	STP M-11C approved by PSRC.
01/19/89	NCR ready for PSRC review. Withheld by assistant plant manager for further discussion.
03/23/89	NCR reviewed by PSRC.
03/28/89	NCR chairman signs off on NCR.
03/31/89	QA verifies corrective actions complete.