

INITIAL SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-275/89-32 AND 50-323/89-32

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT

AUGUST 1, 1988 THROUGH DECEMBER 31, 1989

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and evaluate the licensee's performance based on this information. The program is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful feedback to the licensee's management regarding the NRC's assessment of their facility's performance in each functional area.

An NRC SALP Board, composed of the members listed below, met on February 15, 1990, to review the observations and data on performance in accordance with NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The guidance and evaluation criteria are summarized in Section III of this report. The Board's findings and recommendations were forwarded to the NRC Regional Administrator for approval and issuance.

This report is NRC's SALP Board assessment of the licensee's safety performance at the Diablo Canyon Nuclear Power Plant, for the period August 1, 1988 through December 31, 1989.

The SALP Board for Diablo Canyon was composed of:

- R. P. Zimmerman, Director, Division of Reactor Safety and Projects
(Board Chairman)
- R. A. Scarano, Director, Division of Radiation Safety and Safeguards
- A. E. Chaffee, Deputy Director, Division of Reactor Safety and Projects
- S. A. Richards, Chief, Reactor Projects Branch
- C. M. Trammell, Acting Director, Project Directorate V, NRR
- H. Rood, NRR Project Manager
- D. F. Kirsch, Chief, Reactor Safety Branch
- M. M. Mendonca, Chief, Reactor Projects Section 1
- P. P. Narbut, Senior Resident Inspector

II. Summary of Results

A. Overview

The Board found that the licensee made notable progress on a number of issues and programs discussed in last year's SALP report. Specifically:

- o The licensee initiated efforts to reduce engineering errors and to improve their overall performance in this area. Licensee engineering initiatives included commencement of a design basis document reconstruction effort; continuing development of the onsite engineering program; and the improvement of the interface between the corporate engineering staff and the site staff.



- o The number of events related to procedural compliance and communication issues have declined considerably.
- o Quality Assurance has successfully implemented improved performance based audit programs in the areas of system design, design changes and NSSS services. The improved programs produced meaningful indepth technical findings.

In the above areas, the licensee generally demonstrated a solid commitment to address problems with adequate resources and conservative approaches.

However, the SALP Board, as in the previous SALP period, found the licensee's identification of some problems and the implementation of corrective actions to often be slow. For these problems continual attention from the NRC appeared to be required such that the licensee recognized the problem, reviewed the problem in a comprehensive manner, and initiated meaningful corrective action. Examples discussed in the report included problems with valve lineup errors and excessive overtime usage.

At the root of this issue seemed to be a lack of problem ownership. Whereas problems limited to a single department were usually addressed in a timely way, it appeared that managers and staff were reluctant to take ownership of problems which involved multiple departments. Therefore, the Board recommends continued management attention to ensuring that direct responsibility for addressing any given problem is promptly identified, and then ensuring that timely action is initiated to address the problem area.

Three NRC inspections, which occurred after the SALP period, were considered by the SALP Board. The first was a security inspection which identified several problem areas, the second inspection was a team inspection of corrective action programs, and the third was a routine emergency preparedness inspection.

B. Results of Board Assessment

Overall, the SALP Board found the performance of NRC licensed activities by the licensee to be acceptable and directed toward safe operation. The SALP Board has made specific recommendations in most functional areas for licensee management consideration. The results of the Board's assessment of the licensee's performance in each functional area, including the previous assessments, are as follows:

	<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>	<u>Trend*</u>
A.	Plant Operations	2	1	
B.	Radiological Controls	1	1	
C.	Maintenance/Surveillance	2	2	Improving
D.	Emergency Preparedness	1	1	



E.	Security	2	2	Improving
F.	Engineering/Technical Support	2	2	Improving
G.	Safety Assessment/Quality Verification	2	2	Improving
H.	Fire Protection	1	--	(No longer rated separately)

* The trend indicates the SALP Board's appraisal of the licensee's direction of performance in a functional area such that continuation of this trend may result in a change in performance level. Determination of the performance trend is made selectively and is reserved for those instances when it is necessary to focus NRC and licensee attention on an area with a declining performance trend, or to acknowledge an improving trend in licensee performance. It is not necessarily a comparison of performance during the current period with the previous period.

C. Changes in SALP Ratings

The changes to the SALP ratings from the previous SALP period were a Category 1 performance in Operations and improving trends in Maintenance/Surveillance, Security, Engineering/Technical Support, and Safety Assessment/Quality Verification.

The previous rating in the Operations functional area had been a Category 2 with an improving trend. The Board determined that the generally conservative responses by Operations personnel outweighed concerns in this area regarding instances of weak management oversight and slow problem identification and resolution, such as the continuing problems observed with valve alignments.

The improving trends in the previously mentioned functional areas were primarily due to extensive licensee resources applied in these areas.

III. CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction or operational phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

The following evaluation criteria were used, as applicable to assess each functional area:

1. Assurance of quality, including management involvement and control;
2. Approach to the resolution of technical issues from a safety standpoint;
3. Responsiveness to NRC initiatives;



4. Enforcement history;
5. Operational and construction events (including response to, analyses of, reporting of, and corrective actions for);
6. Staffing (including management); and
7. Effectiveness of the training and qualification program.

However, the NRC is not limited to these criteria and others may have been used where appropriate.

On the basis of the NRC assessment, each functional area evaluated is rated according to three performance categories. The definitions of these performance categories are as follows:

1. Category 1. Licensee management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.
2. Category 2. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are good. The licensee has attained a level of performance above that needed to meet regulatory requirements. Licensee resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.
3. Category 3. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The licensee's performance does not significantly exceed that needed to meet minimal regulatory requirements. Licensee resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

IV. PERFORMANCE ANALYSIS

The following is the Board's assessment of the licensee's performance in each of the functional areas, plus the Board's conclusions for each area and its recommendations with respect to licensee actions and management emphasis.

A. Plant Operations

1. Analysis

During the assessment period, the licensee's plant operations activities were observed routinely by both the resident inspectors and the regional staff. Additionally, in December 1989, a team inspection was conducted to review emergency operating procedures



(EOPs). A total of more than 1600 hours of inspection effort was devoted to this functional area.

The licensee's performance in this functional area during the previous SALP period was rated as Category 2, improving trend. Prominent issues of the previous SALP requiring attention in this functional area included the effectiveness of management feedback mechanisms, the continued need for emphasis in communications and procedural compliance, and the slow movement towards establishing formal root cause reviews for appropriate operational events. In general, the licensee's efforts to address these issues have been successful, as discussed below. One remaining concern, however, is the licensee's occasional apparent inability to recognize and address issues in a timely manner.

During this SALP period, few significant operational events were attributable to causes relevant to this functional area. In 1989, Unit 1 completed a record 399 day run, and both Units 1 and 2 each experienced only one automatic trip. The Unit 1 trip, which could not have been foreseen, occurred when work was authorized on instrumentation which shared a process line with a plant protection channel. A contributory factor in the Unit 2 automatic trip, was the unavailability of a circulating water pump due to an equipment alignment problem. Unit 2 operators initiated three manual reactor trips in 1989, which were conservative responses to abnormal plant conditions such as condenser salt water intrusions. Additionally, it was noted that the licensee initiated comprehensive data gathering efforts to identify the root cause of the more significant events. Very early in the SALP period, the facility experienced three additional automatic plant trips.

A significant management problem which developed during this rating period was the lack of timely corrective action taken to address repeated valve and equipment lineup problems. The valve lineup problems contributed to one unplanned reactor trip, several engineered safety features actuations, and inoperable instrumentation. The equipment lineup problems resulted in the issuance of an escalated enforcement action and civil penalty. Although subsequent corrective actions were extensive, valve and equipment lineup problems continued throughout the rating period. At the end of the period, Operations Management was in the process of reassessing the equipment alignment program.

The licensee's approach to the resolution of technical issues was generally conservative with approaches viable and generally sound and thorough. This was evidenced by the conservative action to shutdown Unit 2 to repair a leaking pressurizer safety valve, and by the fact that the licensee has been at the forefront of safety valve problem reviews and testing. Also, the licensee's fire protection enhancements have been well beyond NRC minimum requirements, e.g., the use of the Plant Information Management System to manage fire barriers and system configuration control. Other examples of conservative actions included rapid operator assessments on three separate occasions of abnormal plant conditions, and the appropriate



initiation of manual reactor trips of Unit 2 in each instance. However, operations personnel have not responded conservatively nor displayed appropriate instincts in all instances. For example, during the Unit 1 refueling outage, fuel handling building radiation alarms were not properly responded to by operations personnel, which resulted in a violation included in the radiological controls functional area.

The licensee is generally responsive to NRC initiatives. As an example, the EOP inspection observed that the licensee was self-critical and committed to improvements in that area. Also, the issues of communications and procedural compliance, which have been discussed in the last two SALP reports, did not contribute significantly to plant events. However, the major issue and NRC initiative of the last SALP, the need for timely problem recognition and the initiation of corrective actions, remains a concern.

During the assessment period there were two enforcement actions, one Severity Level III violation and one Severity Level IV violation, and 18 LERs in the operations area. Additionally, although enforcement action was not taken until after the end of the SALP period, other escalated enforcement actions were identified during the SALP period, which involved: (1) the failure to perform adequate containment sump cleanliness inspections; and, (2) use of an unlicensed individual as Shift Supervisor during the Unit 2 refueling outage. The importance of successfully communicating management expectations regarding personnel verifications was emphasized at the enforcement conference for the sump violation, and the importance of conservative management decisions was emphasized with regard to the unlicensed Shift Supervisor violation issue.

With respect to operations staffing, key positions were identified and responsibilities defined with key vacant positions usually filled in a reasonable time. As previously mentioned, a notable exception to the above was the use, during the Unit 2 second refueling outage, of a management individual with an expired senior reactor operator license to fulfill the then newly established operations shift supervisor's position, which normally requires an active SRO license. While on-shift staffing normally exceeded regulatory requirements, it was noted during the EOP team inspection that a shortage of office staffing for developing and maintaining EOPs may have contributed to the slow resolution of identified EOP problems.

The licensee's operations training program was well defined and implemented with dedicated resources. The overall pass rate on qualification exams was 94% and was considered well above average. Also, feedback from the training program was used to upgrade operations procedures. The licensee's training facilities include a well maintained plant simulator. The overall high quality of operator training was consistently exhibited during not only the EOP inspection, but also during emergency preparedness exercises. Finally, inadequate training was rarely the cause of plant events.



2. Performance Rating

Performance Assessment - Category 1. The SALP Board deliberated at length in considering whether a Category 1 rating was warranted in this functional area. The Board ultimately concluded that the overall performance in this functional area outweighed concerns raised primarily by valve alignment problems and issues involving the operability of the containment sumps.

3. Board Recommendations

Licensee management should focus attention on ensuring that valve alignment errors are minimized and should be sensitive to promptly addressing other developing problem areas, prior to those problems causing a significant event. Management should continue to require that operations personnel conduct their duties in a professional and conservative manner.

B. Radiological Controls

1. Analysis

A total of six routine inspections were performed in the area of radiological controls, examining aspects of occupational radiation safety, management and organization, radiological effluent control and monitoring, radioactive waste management, transportation of radioactive materials, training and qualifications, confirmatory measurements, and licensee events. In addition, the resident inspectors provided continuing observations in this area. Approximately 328 hours of inspection effort were performed in this functional area.

The licensee's performance rating in this functional area during the previous SALP period was Category 1. SALP Board recommendations in the previous SALP included assuring personnel fully understand ALARA concepts, radiological work practices, and procedural compliance requirements. In general, the licensee's efforts to address these recommendations have been successful, with additional attention needed in the management of outage activities.

During this assessment period, licensee management continued to exhibit active involvement in the area of chemistry and radiological controls. Management had developed goals and performance indicators in several areas; including external and internal exposure control, contamination minimization, material control and waste reduction. The staff's awareness of management's goals and expectations was evident.

During this assessment period, there was continued management support of the chemistry program. For example, the licensee implemented several changes in plant chemistry intended to minimize crud buildup and corrosion. These changes included: use of hydrazine in the secondary system to scavenge oxygen and secondary system low level boric acid feed to control steam generator tube



denting. The licensee also initiated elevated lithium chemistry in the reactor coolant to increase the pH. These techniques are intended to reduce steam generator maintenance and decrease dose rates from reactor coolant system components.

The licensee's continued commitment and support for the implementation of a strong and effective radiation protection program was evident during this assessment period. As a result of NRC comments during the 1988 Unit 2 refueling outage, and the licensee's internal evaluation of past performance, the licensee completely revised their ALARA program in time to support the 1989 Unit 1 refueling outage. In addition, the licensee implemented some innovative concepts which included "High Impact Teams" (HIT) and a Management Incentive Program (MIP) to enhance their ALARA program. The HIT concept represented a major commitment of manpower to the outage planning and preparation phases during the Unit 1 refueling outage. The MIP provided the licensee's staff with various types and levels of awards for maintaining exposures at or below the established ALARA goals. The licensee's overall year to end exposure for 1989 was approximately 3% less than the man-rem goals that were established by the licensee. However, some poor health physics and work practices that were apparent in the previous outage were not effectively corrected during the latest outage.

During the SALP period, only one Severity Level IV violation was identified as compared to the two Severity Level IV violations and one deviation that were identified during the previous SALP period. The violation, previously mentioned in the operations functional area, involved the failure to adequately instruct personnel upon receiving an evacuation alarm for the Fuel Handling Building Area Radiation Monitor (ARM), RE-58.

A total of seven Licensee Event Reports (LERs) were received in this functional area during this SALP period. The NRC inspection of these LERs did not result in any violations.

During this assessment period, the licensee continued to demonstrate management's involvement in ensuring quality; however, corrective actions were not always timely or effective in correcting the root cause of the problem. For example, the untimely and ineffective resolution of problems associated with the spent fuel pool radiation monitor alarms during core off load operations contributed to a violation of 10 CFR Part 19.12, which was previously discussed. The licensee has proposed a Technical Specification (TS) change to increase the setpoint of this monitor to prevent frequent Engineered Safety Features (ESF) and alarm actuations. The documentation developed for the proposed setpoint changes was thorough.

Staffing considerations for normal plant operations and refueling outages were routinely evaluated by the licensee. Authorities and responsibilities of the licensee's staff were well delineated. The staff was highly qualified, with certified health physicists on-site and at the corporate office. The normal plant staff turnover rate was low. A minimum of contractor assistance was utilized. Additions



to the professional staff during this SALP period have added increased depth and scope. However, staffing of contractor radiation protection technicians for the Unit 1 refueling outage appeared to be marginal at the onset of the outage as evidenced by the poor health physics and work practices that were identified.

The licensee's training program for the technical staff and for the radiation protection and chemistry technicians was considered to be another strength. An industry accredited training program for chemistry and radiation protection technicians has been implemented. The subjects addressed include both refresher and enrichment topics. Additionally, the licensee has set demanding standards for contract technicians providing assistance during outages. Senior radiation protection technicians employed for outages must take and pass a 2-4 hour specific knowledge examination. The licensee reported that this practice resulted in an increase in the quality of the technicians sent to the plant. The licensee has also implemented a five month long, full time, technical staff training program. This program includes all aspects of plant operation. It is designed to provide a common base of knowledge to the technical staff. Radiation protection engineering staff members have been included in this program.

2. Performance Rating

Performance Assessment - Category 1.

3. Board Recommendation

The licensee is encouraged to continue the current aggressive approach being taken towards ALARA and to improve the quality of health physics and work practices during outages.

C. Maintenance/Surveillance

1. Analysis

This functional area was observed routinely during the assessment period by both the resident and regional inspection staff. Approximately 641 hours of inspection effort were devoted to this functional area. Issues discussed in the previous SALP for this functional area, which was previously rated a Category 2, were the control of the maintenance backlog, the continuing relatively large number of personnel errors, the adequacy of I&C procedures, engineering involvement in plant activities, and the slow implementation of lessons learned.

Management oversight of maintenance activities was generally effective. The issues discussed in the previous SALP were not a significant contributor to plant events during this SALP period. An example of management's effectiveness in resolving long standing problems was the achievement of "black" control room annunciator boards for both Units 1 and 2. The "outage coordination center" has also been used as an effective management oversight tool. The



concept is simply to make available in one room all the appropriate management personnel required to make decisions necessary to expedite the resolution of problems during an outage.

The licensee's surveillance program appeared to be well established and implemented. Although several missed surveillances were reported during the SALP period, most were either non-routine or resulted from mis-interpretation of Technical Specification requirements. The Inservice Inspection (ISI) program is likewise well established and implemented by a qualified licensee staff.

However, it was noted that management oversight was insufficient in the area of personnel overtime. That is, during the Unit 1 outage, a large number of plant personnel working safety-related jobs, were working hours in excess of those allowed by the Technical Specifications. Periodic review of overtime records by plant management, also required by the Technical Specifications, was not being accomplished. The licensee was not responsive to the inspector's finding, and in the week following the first discussions of excessive overtime, a number of additional maintenance personnel exceeded overtime restrictions. Additionally, an effort to determine the scope of the overtime problem was not initiated for three weeks and required continuing expressions of NRC concern.

The licensee's understanding of technical issues in this functional area was generally apparent. The licensee has also taken an industry lead in a number of issues related to this functional area. Examples include safety valve testing, the detection of counterfeit materials, and the resolution of diesel generator air start motor problems. Additionally, conservatism was generally exhibited as was the case when Unit 2 was shut down to repair a leaking pressurizer safety relief valve. An understanding of subtle technical problems was exhibited by maintenance personnel when the environmental qualification of main steam isolation valve actuation components was questioned.

However, some known problems recur before they are effectively addressed and resolved. Representative of this was the use of outdated drawings to perform corrective maintenance on the Unit 2 turbine driven auxiliary feedwater pump overspeed stop valve in February 1989. The drawings had been previously recognized as being outdated during maintenance activities in November 1988. Additionally, following identification by the inspector of a fire door which had the latch function defeated, corrective actions did not preclude maintenance personnel the following week from propping the same door open with a pair of pliers.

Although the licensee tends to be slow to address and respond to NRC concerns and continued NRC scrutiny is sometimes necessary to ensure that the concerns are appropriately considered, responses are technically sound and thorough in almost all cases. This is evidenced by the licensee's response to issues discussed in the last SALP period. Long-standing issues which the licensee had been slow to respond to, such as configuration control, I&C procedures, and



the need for personnel to stop in the face of uncertainty, appeared to have been well addressed during this SALP period. However, the licensee has been slow to address some concerns discussed during this period. One example is the issue of plant material condition. Although various aspects of plant material condition had been discussed in a number of inspection reports in the second half of the SALP period, e.g., the condition of the intake structure and components, the licensee has not yet defined a long range program for dealing with such concerns.

During the SALP period, the violations attributed to this functional area were minor and not repetitive, and with the notable exception of the overtime issue, did not indicate a programmatic breakdown.

The licensee at the start of the SALP period experienced a number of less significant events which could be attributable to maintenance and surveillance personnel error-related activities. However, events associated with personnel error were infrequent during the second half of the SALP period, indicating improvements in this area. Additionally, events attributable to procedure errors and procedure compliance were also infrequent. In general, the licensee was adept at handling the root cause investigation of more significant events such as reactor trips. An example was the comprehensive response to the Unit 2 condenser tube leak of July 1989.

However, there were instances of improperly performed maintenance and surveillance on safety-related equipment. An example was the improper maintenance of the AFW pump trip throttle valve. Similarly, the identification of inadequate surveillances of containment recirculation sump cleanliness by NRC inspection activities highlighted the problem. These findings indicate an increased need for attention to assure plant design is appropriately implemented through maintenance and surveillance activities.

Staffing issues discussed during the previous SALP period appear to have been addressed. Specifically, noted improvements in instrumentation and control procedures, as well as the achievement of a "black board" for control room annunciators indicate that attention has been placed in these areas. However, the need to use extensive overtime during outages appears to indicate that outage staffing requirements need to be reviewed if the licensee continues to pursue ambitious outage schedules.

The licensee maintains a state of the art training facility for maintenance and testing personnel, which demonstrates that management is dedicated to providing quality training. One example is the simulated solid state protection system (SSPS). Prior to performing sensitive maintenance activities on the plant SSPS, technicians were able to train on the simulated system. Additionally, a diesel generator similar to those installed in the plant was purchased during this SALP period and a training program is being devised to utilize it. Inadequate training has not been a



significant contributing factor to plant events caused during construction, maintenance or surveillance work.

2. Performance Rating

Performance Assessment - Category 2, Improving Trend.

3. Board Recommendation

Management should review outage activities which precipitated the need to use extensive overtime. Management should also strive to improve oversight in the area of problem identification and resolution with an emphasis on taking timely action. Given the relative age of Diablo Canyon and the number of problems associated with plant material condition, plant management should put additional effort into addressing the maintenance of plant material condition. The licensee should continue to take actions to strengthen the maintenance and operations staffs' understanding of the plant design, and the sensitivities of the design to deficiencies. An improved understanding may have prevented the operability issues which occurred regarding the containment sumps and the auxiliary feedwater pump trip valve.

D. Emergency Preparedness

1. Analysis

The previous SALP analysis included several strengths and no specific weaknesses associated with the licensee's emergency preparedness (EP) program. Management support of the EP program and the licensee's conservative approach to EP issues were identified as strengths. The licensee has been rated as a SALP Category 1 performer during the last four SALP appraisal periods. During the last SALP appraisal period, the Board recommended that the licensee continue to maintain management attention to ensure a high level of performance in this functional area.

During this SALP appraisal period, Region V conducted two routine inspections and observed two annual EP exercises. A Region V Site Team participated in the 1989 exercise. The routine inspections assessed the operational status of the EP program, the licensee's response to previous inspection findings and the licensee's activities involving the onsite emergency warning system. Approximately 270 hours of direct inspection effort were expended in the EP functional area. Strengths identified during this assessment period included management support of the EP program, responsiveness to NRC initiatives, and the thoroughness of the licensee's corrective actions. Areas needing improvement were noted, such as, untimely corrective action and the level of technical (engineering) staffing in the Technical Support Center (TSC) and Emergency Operations Facility (EOF). The TSC/EOF staffing issues were identified during the 1989 exercise.



The inspections conducted during this appraisal period found strength in licensee management support of the EP program. For example, management took aggressive steps to escalate corrective actions after a Quality Assurance (QA) audit report identified the existence of a long standing, internally identified problem with the audibility of the site emergency signal. Licensee management also took immediate, interim corrective action until the alarm devices could be installed and made operational. Strength in this area was also demonstrated when the President of the Company issued a letter which communicated expectations concerning emergency preparedness training attendance.

In general, the licensee's approach to resolution of issues from a safety standpoint was determined to be sound. There was, however, an isolated example where the licensee's corrective actions were not considered to be timely and the issue could have had an effect on personnel safety. This issue also involved the audibility of the site emergency signal (i.e., the signal could not be heard in several locations around the site), but in contrast to the strength identified above, a weakness was identified because the licensee did not take corrective action until it was identified by QA, approximately two years later. As indicated above, licensee management was very responsive after the matter was brought to its attention; however, the delay in correcting the matter indicated that the problem did not get to the appropriate levels of management or that the matter was not considered to be high in priority. Once corrective actions were taken, they were considered to be thorough and well thought-out.

A strength was also identified with respect to the licensee's responsiveness to NRC initiatives. This strength was demonstrated when the licensee responded to NRC concerns about false siren activations. The licensee showed a sensitivity to the issues and initiated prompt, thorough corrective actions to reduce the number of false activations.

No violations of NRC requirements or LERs were identified in this functional area during this assessment period.

The licensee had several opportunities to implement its emergency plan during this appraisal period. The most notable examples were an earthquake and the arcing in the main generator exciter, both of which occurred in October 1989. The licensee's response in each case was timely and in accordance with procedures. Notifications to the offsite authorities were made in a timely manner.

The licensee has continued to maintain a stable and effective staff to implement its EP program. An area needing improvement, involving the emergency response staffing, was identified during the 1989 annual emergency exercise. Observations made during the exercise indicated a need to strengthen the engineering support in the TSC and EOF.



The inspections conducted during this appraisal period showed that the licensee's training and qualification program has been effective. As stated above, the emergency plan has been implemented correctly during real events. Dose assessment capabilities were assessed during walkthrough interviews and found to be dependable and no major findings were identified during the 1988 and 1989 annual emergency exercises. A routine inspection was conducted immediately following the end of this SALP appraisal period. The inspection disclosed that the licensee had not completed a report for a Health Physics drill conducted in April 1989. The failure to issue a timely drill report could affect the licensee's ability to correct training deficiencies identified during drills.

The NRC staff has reviewed the changes made to the Diablo Canyon emergency plan during the appraisal period. The changes are acceptable and the licensee continues to meet NRC requirements.

2. Performance Rating

Performance Assessment - Category 1.

3. Board Recommendations

The licensee should ensure that problems related to EP are corrected in a timely manner. Licensee management should take the necessary steps to strengthen the engineering support in the TSC and EOF, and ensure a high level of EP is maintained as a result of management's continued support.

E... Security

1. Analysis

During this SALP period Region V conducted three physical security inspections and one material control and accounting inspection. Over 220 hours of inspection effort were expended by regional safeguards inspectors. In addition, the resident inspectors provided observations in this area. The previous SALP rated the licensee a category 2 in the security functional area.

The last two SALP reports encouraged licensee management to become more involved and resolve an identified safety/security issue involving radio communication frequencies for security and operations personnel. Last year's SALP report indicated that the licensee was approximately 70% complete with this project. During this SALP period, the licensee completed modifications to the security radio communications equipment to avoid possible interference with the radio communication equipment of the Units 1 and 2 operations staff.

The previous SALP report encouraged licensee management to finalize their modifications to the protected area barrier and the perimeter security alarms at the Intake Structure. As discussed below, after recent redesign, the licensee has completed the installation of



approximately 90% of the protected area barriers and associated security alarms. The previous SALP report also encouraged licensee management to minimize the deficiencies and to improve the image clarity of their closed circuit television (CCTV) cameras. As discussed below, this has been completed.

Overall, for this SALP, the licensee's security program was acceptable, and exceeded minimum requirements in the area of security officer training and satisfied minimum requirements in areas of compensatory measures, protected area barriers and detection aids, and alarm stations.

With regard to management's involvement in assuring quality, corporate and plant management continued to review the operation of the overall security program. They have generally implemented remedial measures to correct deficiencies and weaknesses identified in the course of both internal and NRC security inspections. In May 1989, the licensee completed the expansion and remodeling of their security access control building. This improved facility provided the capability of searching and processing personnel entering the protected area in a more effective and efficient manner, and assisted in reducing the number of security log incidents. Additionally, during this assessment period, the licensee resolved security concerns identified in an earlier NRC information notice by completing modifications to their heating, ventilation and air conditioning (HVAC) ducts.

During this assessment period, the licensee resolved long term image deficiencies with their installed CCTV cameras. The additional management attention directed at this issue resulted in changes that improved the image of all required CCTV cameras to an acceptable level. Additionally, as a result of a previous enforcement action, the licensee erected new CCTV cameras to allow viewing of the entire protected area perimeter.

As a result of a November 1987 event, the licensee determined that the electrical design load of their security emergency power supply system was inadequate and initiated action to upgrade the capacity of this system. At the end of this SALP period, the licensee had installed the necessary equipment to complete this project. This equipment is scheduled for final acceptance-testing in early 1990.

During the past five years, the perimeter security alarms at the Intake Structure have been inoperative and the licensee has continued to provide long term compensatory measures at this area. During this SALP period, the licensee totally redesigned the placement of the protected area barriers and required security alarms at the Intake Structure, with installation approximately 90% complete.

The licensee's resolution of identified technical issues, while slow, appears to have been adequate. In November 1986, the Regulatory Effectiveness Review (RER) report identified a security weakness in CCTV alarm assessment capability. This weakness



involves the manner in which the integrated security systems (barriers, perimeter alarms and CCTV cameras) can be defeated. During this SALP period, a Region V inspection report again identified this weakness. The licensee is currently evaluating means to correct this weakness. The 1986 RER report also identified inadequacies with portions of the licensee's vital area barriers at Units 1 and 2 pipe galleries. The licensee has completed their evaluation and has identified measures to correct these barriers.

During this SALP period, two information notices and one generic letter related to security were issued. The licensee's responsiveness and actions as reviewed to date, were found to be acceptable.

The enforcement history for the SALP period included one non-cited violation related to the licensee's discovery of a sleeping security officer who was acting as a compensatory measure for a perimeter alarm at the main protected area.

During the SALP period, each of the licensee's eleven safeguards events were reported in the Licensee Event Report (LER) format; seven (64%) of these events were caused by personnel errors. These eleven events related to: degraded operation of alarm stations(4); degraded vital area barriers(3); drug related events(2); failed security compensatory measures(1); and miscellaneous events(1).

The four LER's relating to the degraded operation of the alarm stations were caused by two instances of temporary malfunctioning computer equipment, and two situations involving extended personnel errors. These personnel errors included the failure to reactivate (for several hours) a vital area door alarm after testing; and allowing a security officer to repeatedly respond to an incorrect door upon receipt of vital area door alarms. Additionally, during this SALP period, Region V determined that the security alarm station operators, during their performance of assigned duties in the central and secondary alarm stations, were rarely observed by their supervisors. The licensee's corrective action required each security shift lieutenant and sergeant to visit both alarm stations once per shift. The overall effectiveness of this corrective action has not been evaluated by the NRC.

With respect to staffing, key positions and responsibilities were generally well defined. The licensee's overall security training program exceeded minimum requirements, as evidenced by their development of a Tactical Team Response Training Course. This 5-day course has been presented to all security officers. Additionally, the Fitness for Duty training was observed to be comprehensive and well presented.

In February 1990, six weeks following the end of this SALP period, a routine security inspection included a review of the licensee's Safeguards Events Logs, from April through December 1989. Events recorded in these logs identified multiple examples of weak performance, i.e., lack of positive access control, failed



compensatory security measures, and inadequate protection of safeguards information. Initial review of inspection results also indicate a possible reduction in the overall safety/security awareness and attitude of plant employees.

2. Performance Rating

Performance Assessment - Category 2, Improving Trend

3. Board Recommendations

Generally, licensee resolutions and corrective actions for hardware items have been acceptable, however, licensee management is encouraged to finalize these matters on a more timely basis.

Specifically, licensee management is encouraged to resolve the identified weakness with the integrated security system (barriers, perimeter alarms and CCTV cameras). Additionally, the licensee is encouraged to finalize measures to correct identified inadequacies with portions of vital area barriers at Units 1 and 2 pipe galleries. Further, in an effort to reduce extended personnel errors, licensee management is encouraged to examine the effectiveness of supervision of alarm station operations. Based upon the last NRC inspection, additional management attention is also required in employee awareness towards compliance with safety/security procedures.

F. Engineering/Technical Support

1. Analysis

This functional area was reviewed routinely by both regional inspectors and the resident staff. In this functional area, a Safety System Functional Inspection (SSFI) was conducted in January 1989. A total of 679 inspection hours was expended in this functional area. These reviews primarily focused on the San Francisco based Nuclear Engineering and Construction Services (NECS), which is responsible for plant design activities, and the plant engineering group, which includes system engineering.

The licensee's performance in this area was rated as Category 2 during the previous SALP period. Significant issues discussed in that evaluation included: implementation of the design basis into operations and maintenance activities including various aspects of design bases documentation and the availability of design documents to appropriate plant personnel; implementation of the system engineering program, including improving the interface between the corporate and site engineering organizations; and the need for management to ensure that the fundamentals of nuclear plant operations are more clearly understood by engineering personnel.

The above issues were specifically addressed during the SALP period by an NRC SSFI team inspection. The team identified continuing weaknesses in the following areas: plant staff did not fully



understand the plant design basis; the interface between NECS and the site was weak; and some engineering work was found to be incomplete or inadequate. Several violations resulted from these weaknesses and escalated enforcement was taken, based upon findings by both the team and the resident inspectors. Licensee corrective actions included: reemphasis of a comprehensive configuration management program, including design basis document construction; reemphasis of closer system engineer ties with their design engineering counterparts; a complete review of the FSAR and other design basis correspondence to assure commitments are being met; and a review of vendor manuals to ensure important maintenance activities are being accomplished. The licensee has dedicated extensive resources towards the implementation of these corrective actions; however, the SALP board concluded that continued strong management attention is needed in these problem areas.

With respect to the assurance of quality by engineering management, NECS has lagged behind the plant in terms of developing an attitude of self-critical assessment. More emphasis was put on this area in 1989, with greater involvement by engineering quality services, stronger ties between NECS and site engineering personnel, and PG&E engineering and corporate management spending more time at the site and more time with engineering personnel.

Understanding of technical issues was generally apparent and conservatism was generally exhibited. One commendable example was the Long-Term Seismic Program. However, in some instances NECS engineering failed to understand all implications of what were viewed as minor changes on actual plant operations. An illustration of this was the failure to recognize that the upgrading of sections of heat tracing from non-safety related to safety related on the Q-List had implications on the heat tracing already installed, which had not been treated as safety related for several years (e.g., this raised considerations of seismic qualification, procurement, and application of the quality assurance program). There have been examples where system engineering has taken a less than thorough approach to solving problems. Problem investigations have not consistently included fundamentals such as fact gathering, proceduralizing, organizing, and documenting. An example was the investigation of vibration in the charging pump suction line, which was ultimately attributed to a misapplied suction stabilizer for the positive displacement charging pump. The investigation took months to complete and was not considered well planned or controlled.

Engineering has been generally responsive to NRC and industry initiatives and, while resolution is not generally timely, products are of good quality. In this regard, the licensee embarked upon improvement initiatives in the areas of Design Bases Document reconstruction, Configuration Management, and Plant/Systems Engineering, and has expended considerable resources to make these initiatives substantial contributors to improved engineering and technical work quality. Although it took over a year from the time that the licensee first initiated a design basis document program to issue the first document, the licensee has now completed



reconstruction of the design bases for several safety related systems. This work appears to be a substantial effort to improve design understanding and consolidation. Concerns identified during the reconstruction are being resolved in a responsible manner. Following the completion of the first few documents, the licensee conducted SSFI type inspections on certain systems as part of the verification and validation process. These SSFI examinations appeared to be substantial and resulted in several important improvements.

Other licensee initiatives, such as the onsite engineering program, have also received increased attention. In particular, the licensee has implemented a number of initiatives to improve the performance of Plant/System engineers in monitoring the performance of plant systems, improving relationships between plant engineering and design engineering, and involving design engineering more fully into day-to-day plant operations. Most notable among these are: (1) quarterly system walkdowns by the plant system engineer and the design engineer, with a state-of-the-system report to licensee management; (2) rotation programs between the plant system engineer and design engineer; (3) joint plant and design engineer review and consensus on walkdown checklists and trending program attributes; and (4) more centralized trending and tracking of system problems and improvements. In contrast to these initiatives, however, plant management appears to be slow in focusing attention on the issue of plant material condition, although precursors of this issue have led to equipment inoperability (e.g., corrosion problems with the ASW system, degradation and failure of ASW cable, and degradation of the centrifugal charging pump lube oil systems).

Although conducted after the conclusion of this SALP assessment period, a team inspection in January and early February 1990 also made observations in this functional area. The system engineer/design engineer effort was recognized as a significant licensee initiative which had been substantially implemented, although the potential for additional improvement was noted in some cases regarding system/design engineer training and qualification, definition of responsibilities, and the interaction of design engineers with the system engineers and the plant hardware. The team also noted that NECS had more than a year's worth of design engineering work identified for accomplishment (about 25% related to long-term capital improvements), although preliminarily this work inventory appeared to be well-managed and effectively prioritized by NECS management.

The licensee received one escalated enforcement action in this functional area, as discussed earlier, which indicated the need for programmatic attention to the design basis and its implementation. Other violations, although more minor in nature, indicated a need for additional attention in certain areas (e. g., corrective action follow-up, and training on applicable administrative procedure revisions prior to their implementation).



The licensee engineering organization was well staffed as indicated by the scope of work being performed in house. The commitment to the system engineering program was also demonstrated by assigning the function of plant engineering to a separate manager.

The licensee has made notable efforts to train technical staff in a number of areas. A large effort was made to provide technical staff with training in the application of 10 CFR 50.59 and root cause determinations. The licensee also continues to commit resources to providing a sixteen week plant system operation course to technical staff. Management has demonstrated significant interest in engineering improvement initiatives. However, a January 1990 corrective action program inspection team identified weaknesses in the establishment of a formal training program for design system engineers.

2. Performance Rating

Performance Assessment - Category 2, Improving Trend.

3. Board Recommendation

The licensee should continue to place emphasis on established long term programs such as the configuration management and system engineering programs. Attention should also continue to focus on the interface between corporate engineering and the plant, and the formal resolution of plant problems.

Additionally, the licensee is encouraged to be self critical, emphasizing the identification of problems early on and the establishment of aggressive schedules for corrective actions. The issue of plant material condition should also be aggressively assessed.

G. Safety Assessment/Quality Verification

1. Analysis

This functional area was observed routinely during the assessment period by both the resident and regional inspection staffs. Approximately 708 hours of inspection effort were devoted to this functional area. The performance of Quality Assurance, Quality Support (the onsite QA branch), onsite Quality Control, the Onsite Safety Review Group (OSRG), and the Plant Staff Review Committee were included in this assessment, as well as the licensee organizations involved in the review of regulatory and industry initiatives.

During the previous SALP period, the licensee's performance in this area was rated as Category 2. Issues addressed included: the need to perform thorough evaluations of plant problems; the development and implementation of well thought-out corrective action/investigation plans, with appropriate assignment of management responsibility; the need to better include quality



organizations in the review of events; the need for improvements in the quality of licensing submittals; and the need for programmatic assessments of regulatory safety initiatives identified by inspection findings to ensure thorough and timely consideration.

With respect to management involvement and control in the assurance of quality, the Quality Assurance organizations demonstrated extremes of involvement and effectiveness. On the one hand, the QA organization has been on the forefront of the development of performance based inspection activities with the implementation of the Safety System Functional Audit and Reviews (SSFAR) and the audit of their NSSS vendor. On the other extreme, management failed to properly control and monitor the performance of QA program audits of safety related equipment suppliers. This resulted from a breakdown of management control and overview within the QA department, resulting in numerous audits which were inadequate in both scope and content to meet NRC requirements. These deficiencies also emphasized the failure of licensee QA personnel to implement appropriate corrective action program requirements (e.g. issuance of NCRs) in that audit program deficiencies had been noted over a several month period without implementation of any formal corrective action program review. Additionally, management failed to recognize that allowing a non-licensed shift supervisor to stand watch contradicted Technical Specification requirements.

With regard to resolution of technical issues from a safety standpoint, root cause reviews appeared to be technically sound and thorough in most cases. A specific improvement, which was apparent in the quality of licensee QA audits, has been the use of auditors with direct experience in the technical areas being audited. This has been demonstrated specifically in the SSFARs and some recent vendor audits. On the other hand, although a clear understanding of technical issues is normally demonstrated, the Plant Staff Review Committee failed to recognize the significance of allowing work to calibrate a containment sump indicator with the sump access open.

The licensee has been generally responsive to NRC initiatives. One NRC concern from the last SALP period that was well addressed by the licensee involved the initiation of root cause evaluations (Quality Evaluations and Non-conformance reports) for problems on non-safety related systems which could potentially challenge safety systems. Also, the licensee has continued to develop the Event Investigation Team methodology for major events and, when used, results in good products. Overall, the licensee has implemented a viable program for conducting in-depth Event Analyses/Root Cause evaluations. The licensee has been refining their criteria for screening events to more closely conform to industry standards. This effort is expected to result in selection of the more deserving events for analyses, appropriately exclude those events of lesser significance, and improve the quality of event evaluations. Additionally, the licensee has assured that personnel responsible for conducting event evaluations are appropriately trained and qualified in the techniques of root cause analyses.



However, without the formal structure of an Event Investigation Team, where clear management ownership was defined, there have been examples of problem reviews which have been limited in scope and which have involved inadequate corrective actions and less than timely implementation. For example, although an NRC inspector had identified overtime usage in excess of technical specification limits, overtime abuses continued for at least the following week and management did not initiate a review of the implementation of the technical specification requirement for another three weeks. An additional example involved incomplete and untimely follow-up of NRC concerns dealing with safety evaluations and administrative controls for fire protection program components. The licensee responsiveness to equipment lineup problems, repeatedly the cause of minor events and the subject of several inspection reports, was considered inadequate, resulting in escalated enforcement action, as previously discussed.

The licensee provided a large amount of highly technical information in response to staff questions on the Long-Term Seismic Program (LTSP), which was conducted to completely reevaluate the seismic design basis for the plant, using state-of-the art seismic data and analysis techniques, including a full level I Probabilistic Risk Assessment (PRA). Although the licensee's efforts to provide the staff with voluminous and detailed information about this program have required a significant allocation of company resources, the licensee has been quite responsive to the NRC's requests and information has been provided in a timely manner.

Although conducted after the conclusion of this SALP assessment period, a team inspection in January and early February 1990 focused particular attention on the licensee's corrective actions program. This program is managed on the Plant Information Management System (PIMS), a computer-based tracking and communications system used for essentially all types of items, issues, or problems which require corrective action. Walkdown of plant systems, numerous interviews, and substantial reviews of licensee logs and records did not identify any items requiring corrective action which had not been entered into the PIMS program. Preliminarily, the team also did not identify any safety-significant problems which had not received appropriate and timely corrective action. However, action on several items of apparent lesser individual significance had been pending or under evaluation for as much as a few years, and it was not apparent that the licensee had fully evaluated the safety significance of these items. The team also noted that each organizational group was responsible for acting on items assigned to it (unless or until it was reassigned), but that no group or person appeared to feel responsibility or "ownership" for managing the overall system. Plant management stated at the end of the team inspection that, based on an assessment previously in progress, a new organizational group was being established to provide oversight of the corrective actions, root cause, trip reduction, and other similar programs.



During this appraisal period, the licensee submitted nineteen requests for license amendments, and a total of eighteen license amendments were issued. In addition, the licensee resolved safety issues related to six generic letters and three NRC bulletins requiring NRR technical review. Also, three TMI items involving NRR review were resolved. In general, the licensee's understanding of the technical issues involved in these actions was apparent, and in most cases, the resolution was timely.

Although there were no enforcement items specifically attributable to this functional area during the SALP period, aspects of enforcement items discussed in other functional areas emphasize the need for management and quality verification organizations to more fully involve themselves in assuring that programmatic problems are discovered early and addressed in a comprehensive and timely manner. Examples of this have been discussed previously in this report and include: the adequacy of vendor audits; the use of excessive overtime; the assignment of an unlicensed shift supervisor; and providing for effective corrective action, as it related to valve lineup problems. Also symptomatic of a potential problem in the performance of the management and quality verification groups is a noted decline in plant housekeeping.

The quality verification organizations appeared to be adequately staffed and have evaluated a substantial percentage of site activities, such as engineering, design changes, and operations. Additionally, the QA organization used contracted help on a number of audits to its advantage, finding technically qualified individuals to round out audit teams and utilize that expertise to train their employees.

The licensee's training and qualifications program made a positive contribution in this functional area. The licensee continued to emphasize training in the area of root cause identification and corrective actions. Additionally, personnel qualification was a contributor to the quality of many QA and QC audits. The licensee also included QA and QC personnel in the technical staff training program, contributing to system understanding.

2. Performance Rating

Performance Assessment - Category 2, Improving Trend.

3. Board Recommendations

The licensee is encouraged to maintain the emphasis of the quality verification programs on performance based audits, using technical expertise and in depth reviews to identify problems. The licensee is also encouraged to continue to increase the emphasis placed on the identification of problems. In view of the recent problems identified with the performance of vendor audits, the licensee should consider actions to ensure that similar problems do not exist in other areas of the QA organization.



V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

In general, both units operated acceptably during the assessment period. Specific operational activities are summarized as follows:

Unit 1

At the beginning of the SALP period, Unit 1 had just completed its second refueling outage. Two automatic reactor trips were experienced in rapid succession on August 30 and September 1, 1988. Following these trips, Unit 1 operated for 399 continuous days, setting a record for Westinghouse four loop plants. A trip on October 6, 1989, ended the run and the licensee initiated its third refueling outage a week early. The refueling outage included refueling the core with higher enrichment fuel, reactor coolant pump motor modifications, continuation of the snubber reduction program, feedwater control system modifications, and routine maintenance work. The outage concluded on December 14, 1989 and the Unit returned to power operation.

Unit 2

Unit 2 commenced the SALP period at 100% power, experienced a reactor trip on September 1, 1988, and was shutdown on September 17, 1988, to commence its second refueling outage. The refueling outage scope included reactor coolant pump motor modifications, auxiliary saltwater pump overhauls, routine maintenance, and unplanned maintenance on one safety injection pump, which was damaged due to a lineup problem. The outage concluded on December 8, 1988. Unit 2 operated through the remainder of the SALP period at essentially 100% power with the exception of an outage to repair a leaking pressurizer safety valve, one automatic reactor trip, and three manual trips.

Plant status at end of SALP period

Diablo Canyon ended the evaluation period with both units operating at full power.

B. Direct Inspection and Review Activities

A total of approximately 4450 hours of direct inspection were performed during this SALP period. Table 1 provides a summary of those inspection activities. Forty inspections, including a Safety System Functional Inspection Overview team inspection, two Emergency Preparedness exercise team inspections, an Emergency Operations Procedures team inspection, and four management meetings, were conducted during this period. Two resident inspectors were assigned during the SALP assessment period.



C. Enforcement Activity

Along with a summary of inspection activities, a summary of enforcement items resulting from those inspections is provided in Table 1. A description of the enforcement items is provided in Table 2. During the SALP period, a two part escalated enforcement action (\$75,000 Civil Penalty) was identified concerning the failure to implement or maintain design bases through engineering, and the failure to resolve identified problems in a timely, effective manner. Subsequent to the SALP period, but related to events within the period, an enforcement action (\$50,000 Civil Penalty) was issued concerning the construction and cleanliness of the containment sumps. Additionally two level IV violations, regarding vendor QA audits, and one level III violation (no civil penalty), regarding a non-licensed shift supervisor, were issued subsequent to the end of the SALP period.

D. Confirmation of Actions Letters (CALs)

No CALs were issued during the appraisal period.

E. Office of Analysis and Evaluation of Operational Data (AEOD) Event Analysis

AEOD reviewed the licensee's events and prepared a report which is included as Attachment 1. AEOD reviewed LER's and significant operating events for quality of reporting and effectiveness of identified corrective actions.

F. Office of Investigation (OI) Status

On August 1, 1988, OI had three matters that were open and pending relevant to Diablo Canyon. During the period August 1, 1988 to December 31, 1989, OI opened two new investigative matters. As of December 31, 1989, five investigations were open and pending relevant to Diablo Canyon.



Table 1

INSPECTION ACTIVITIES AND ENFORCEMENT SUMMARY (08/01/88 - 12/31/89)

DIABLO CANYON UNIT 1

Functional Area	Inspections Conducted		Enforcement Items					
	Inspection Hours*	Percent of Effort	Severity Level**					D
			I	II	III	IV	V	
1. Plant Operations	789	34			1	1		
2. Radiological Controls	203	8				1		
3. Maintenance/Surveillance	362	16				2		
4. Emergency Prep.	76	3						
5. Security	160	7						
6. Engineering/Technical Support	340	15			1	2	2	
7. Safety Assessment/Quality Verification	396	17						
Totals	2326	100			2	6	2	

* Allocations of inspection hours to each functional area are approximations based upon NRC form 766 data. These numbers do not include inspection hours by NRC contract personnel.

** Severity levels are in accordance with NRC Enforcement Policy (10 CFR Part 2, Appendix C).



Table 1 (continued)

INSPECTION ACTIVITIES AND ENFORCEMENT SUMMARY (08/01/88 - 12/31/89)

DIABLO CANYON UNIT 2

Functional Area	Inspections Conducted		Enforcement Items					
	Inspection Hours*	Percent of Effort	Severity Level**					D
			I	II	III	IV	V	
1. Plant Operations	817	38						
2. Radiological Controls	125	6						
3. Maintenance/Surveillance	279	13					6	
4. Emergency Prep.	194	9						
5. Security	63	3						
6. Engineering/Technical Support	339	16					4	
7. Safety Assessment/Quality Verification	312	15						
8. Fire Protection								
Totals	2129	100					10	

* Allocations of inspection hours to each functional area are approximations based upon NRC form 766 data. These numbers do not include inspection hours by NRC contract personnel.

** Severity levels are in accordance with NRC Enforcement Policy (10 CFR Part 2, Appendix C).



TABLE 2

DIABLO CANYON UNIT 1 ENFORCEMENT ITEMS(08/01/88 - 12/31/89)

<u>Inspection Report No.</u>	<u>Subject</u>	<u>Severity Level</u>	<u>Functional Area</u>
88-25	Failure to meet commitment to issue administrative procedure on reading test instruments.	Deviation	6
89-01	A design change was modified by General Construction without submitting a field change to Diablo Canyon Power Plant (DCPP) for approval.	IV	6
89-01	480V power cable were installed in the plant and attached to instrumentation cable without a safety evaluation.	IV	3
89-01	No information was available to operators on the buildup of carbon dioxide in the control room	Deviation	6
89-15	Component Cooling Water/Auxiliary Saltwater (CCW/ASW) Systems design basis not incorporated into plant procedures; two Auxiliary Feedwater (AFW) pumps out of service greater than 6 hours; ASW pump overcurrent relay not operable for design basis reduced bus voltage; ASW pump impeller replacement did not consider Diesel Fuel Oil (DFO) storage for increased horsepower; AFW overspeed trip mechanism - failure to implement vendor recommendations in test and preventive maintenance procedures	III	6
89-15	Steam driven AFW pump inoperable for 30 days due to open gauge line root valve; untimely corrective actions for compensatory measures for missing DFO transfer pump vault drain backwater check valves.	III	1



TABLE 2 (continued)

DIABLO CANYON UNIT 1 ENFORCEMENT ITEMS

(08/01/88 - 12/31/89)

<u>Inspection Report No.</u>	<u>Subject</u>	<u>Severity Level</u>	<u>Functional Area</u>
89-23	Work was performed on heat tracing without applicable QA requirements translated into the work specifications	IV	6
89-23	Plant maintenance personnel performing safety related work worked in excess of 72 hours in a 7 day period.	IV	3
89-23	Valves for Hydrogen Purge System did not have power removed to satisfy Containment Isolation Technical Specification.	IV	1
89-25	Inadequate response to fuel handling building radiation monitor alarms.	IV	2



TABLE 2 (continued)

DIABLO CANYON UNIT 2 ENFORCEMENT ITEMS(08/01/88 - 12/31/89)

<u>Inspection Report No.</u>	<u>Subject</u>	<u>Severity Level</u>	<u>Functional Area</u>
89-29	Failure to follow administrative procedures for oscillating gauge during surveillance and testing.	IV	6
89-01	The GE/GW ventilation system was declared operational although a partial closure of the design change had not been completed and a field change had not been approved.	IV	6
89-01	The Operations Valve Identification Diagrams for the auxiliary building ventilation system were not updated to include a recent modification.	IV	6
89-01	A Class 1 support was not located in accordance with the approved design.	IV	3
89-01	Four flange bolts on Safety Injection (SI) cooling water line and damper fasteners did not have full thread engagement.	IV	3
89-01	Bolts were replaced in the GE/GW ventilation system without written work orders.	IV	3
89-01	Nine GE/GW welds were not inspected prior to the system being declared operable.	IV	6
89-01	An anchor bolt on the ventilation system was identified as not meeting the required torque - no action was taken to evaluate the discrepancy. Numerous obvious discrepancies existed with electrical conduits, loose pipe hangers and missing nuts and washers on pipe hangers on SI pump 2-2 that were not reported on an Action Request.	IV	3



TABLE 2 (continued)

DIABLO CANYON UNIT 2 ENFORCEMENT ITEMS(08/01/88 - 12/31/89)

<u>Inspection Report No.</u>	<u>Subject</u>	<u>Severity Level</u>	<u>Functional Area</u>
89-05	A split washer to the Unit 2 auxiliary feedwater pump over-speed stop valve FCV-152, was modified without being processed as a design change.	IV	3
89-21	The fire door to the Unit 2 Residual Heat Removal (RHR) Heat Exchanger room was impaired.	IV	3



TABLE 3
DIABLO CANYON UNIT 1
SYNOPSIS OF LICENSEE EVENT REPORTS

<u>Functional Area</u>	SALP Cause Code*					<u>X</u>	<u>Totals</u>
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>		
1. Plant Operations	4				1	1	6
2. Radiological Controls	1	1		2			4
3. Maintenance/Surveillance	5			2			7
4. Emergency Preparedness							
5. Security	5	1			2		8
6. Engineering/Technical	6	2		2			10
7. Safety Assessment/ Quality Verification		1					1
Totals	21	5		6	3	1	36

* Cause Codes:

- A - Personnel Error
- B - Design, Manufacturing or Installation Error
- C - External Cause
- D - Defective Procedures
- E - Component Failure
- X - Other



TABLE 3
DIABLO CANYON UNIT 2

SYNOPSIS OF LICENSEE EVENT REPORTS

Functional Area	SALP Cause Code*					X	Totals
	A	B	C	D	E		
1. Plant Operations	3	3		1	3	2	12
2. Radiological Controls		1		1	1		3
3. Maintenance/Surveillance	6	4		2	1		13
4. Emergency Preparedness							
5. Security	2					1	3
6. Engineering/Technical	1	1					2
7. Safety Assessment/ Quality Verification							
Totals	12	9		4	5	3	33

* Cause Codes:

- A - Personnel Error
- B - Design, Manufacturing or Installation Error
- C - External Cause
- D - Defective Procedures
- E - Component Failure
- X - Other



7
6
5
4
3
2
1



Attachment 1

AEOD Input to SALP Review for Diablo Canyon

During the assessment period 54 LERs were reviewed:

Unit 1: 88-23 through 89-13

Unit 2: 88-08 through 89-10

1. Important Operating Events

Utilizing AEOD's screening process, the following seven Unit 1 and Unit 2 LERs were categorized as important events:

Unit 1

50-275/88-28 "Entry Into Technical Specification 3.0.3 When Two of Four Main Steam Isolation Valves (MSIVs) Were Inoperable Due to Inadequate Environmental Qualification of Electrical Connections." Two of four main steam isolation valves on each unit were declared inoperable, due to inadequate environmental qualification of electrical surge suppressors located across terminal connections for the MSIV solenoid control valves. Short circuiting of surge suppressors could potentially blow control power fuses and preclude operator action to close the MSIVs during certain accident scenarios. Failure to meet the applicable technical specification (TS) action statement resulted in entry into TS 3.0.3. The subject surge suppressors and electrical connections were removed and replaced with environmentally qualified splices.

50-275/89-02 "Failure to Reinstall Backwater Check Valves in Fuel Oil Transfer Pump Vault Drain System Due To Inadequate Instructions to Contractor Personnel." Drain lines in the diesel fuel oil transfer pump vaults did not have backwater check valves installed. The backwater check valves, described in the Updated Final Safety Analysis Report, provide back flood protection for the diesel fuel oil transfer pump vaults in the event of blockage in the drain line concurrent with flooding in another headered vault. Loss of the transfer pumps due to flooding would prohibit transfer of diesel fuel oil from the storage tanks to the diesel generator day tanks. As partial corrective action, backwater check valves were installed in drain lines from the transfer pump vaults.

50-275/89-09 "Safety Injection and Reactor Trip From Steam Line Differential Pressure Spurious Signals." An automatic safety injection and reactor trip was initiated as a result of plant personnel creating pressure oscillations in a sensing line during testing.

The importance of this event is that at the time of the reactor trip, two of the four atmospheric steam dump valves (ADV) had been removed from service. This is permissible by the plant technical specifications, but plant emergency operating procedures specified that the ADVs be used for reactor coolant system cooldown. AEOD is evaluating the generic aspects



of permitting equipment required by EOPs to be removed from services without appropriate clearance controls.

50-275/89-10 "Thimble Tube Thinning Due to Flow-Induced Vibration." In response to NRC Bulletin 88-09, eddy current inspection of incore neutron monitoring system thimble tubes revealed 28 tubes exceeding 50 percent through-wall degradation, due to flow-induced vibration. As partial corrective action, 33 tubes were replaced and 12 tubes were repositioned.

Unit 2

50-323/88-08 "Reactor Trip and Subsequent Safety Injection Following an Electrical Ground on a Connector to Reactor Coolant Pump 2-2 Due to Galling on the Threads of an Aluminum Stud." Deterioration of a galled aluminum electrical connector for reactor coolant pump (RCP) 2-2, resulted in an electrical ground fault, a manual reactor trip, and a RCP 2-2 manual trip. Loss of 12 kV start-up (offsite) power was also experienced during the event.

Investigation of the trip revealed several associated problems. These included 1) defective welds on a fuse block for a grounding transformer, 2) routing of the neutral cable for start-up transformer 2-1 grounding bank along the top of the resistor bank (subjecting the cable to intense heat, which resulted in burning of the cable insulation), and 3) inadvertent blockage of air cooling to the resistor bank.

Licensee corrective actions included analyzing grounding resistor heat loadings, cable rerouting, infra-red surveillance of RCP high voltage connections, and improved housekeeping controls in the resistor bank area.

50 323/88-14 "Anchor Darling Check Valve Retaining Block Stud Breakage Due to Intergranular Stress Corrosion Cracking" (IGSCC). A check valve, located in the residual heat removal (RHR) hot leg injection line, was found to have two broken retaining block studs. Incorrect manufacturer heat treatment of the block studs caused susceptibility to IGSCC. The licensee's analysis concluded the valve would remain operable with broken studs. The failed valve was repaired, and other similar valves were inspected for the same concern.

50-323/88-15 "Residual Heat Removal Pump 2-2 Lower Motor Bearing Housing Failure Due to Inadequate Engagement of the Shaft Nut Locking Washer." RHR pump 2-2 was declared inoperable when a lock tab washer on the vertical motor rotor shaft rotated, allowing the shaft thrust bearing nut to loosen. The loosened thrust bearing nut allowed the shaft to drop axially and create metal to metal contact with the lower motor bearing housing causing mechanical failure of the oil reservoir and subsequent oil leakage and smoke generation. Inadequate design and preventative maintenance were identified as root causes of the failure.

2. Preliminary Notifications

Eight preliminary notifications (PNs) pertaining to Units 1 and 2 were issued by Region V during the assessment period. For those events



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described in the PNs which warranted LERs from the licensee, the LERs were verified to have been submitted. No omissions were identified.

3. LER Overview

Causes of the events are distributed among various categories, however on Unit 1 an inordinate number of the LERs were associated with personnel error. Procedural inadequacies were also prominent. On Unit 2, the largest number of events were also personnel errors, and many were similarly associated with inadequate procedures.

4. LER Timeliness and Quality

LERs submitted by the licensee were timely and of high quality, with the exception of the following:

LER 50-323/88-20 "Containment Ventilation Isolation and Fuel Handling Building Ventilation Shift to the Iodine Removal Mode," utilized terms such as FCV-128, FCV-111A, and RM 28A without providing further component descriptions or piping diagrams. Additional clarification should be provided in the LER when plant specific designations are utilized.

LER 50-323/87-20 "Entry Into Technical Specification 3.0.3 Due to Both Trains of Auxiliary Building Ventilation Being Inoperable," indicated a supplement would be issued. The event did not occur during this evaluation period, however, the supplemental report was not issued until July 28, 1989. This appears to be an inordinate amount of time to determine root cause and corrective action, and provide the supplemental information to the NRC.

5. Abnormal Occurrences and Other Events of Interest

No events occurring during this assessment period were classified as Abnormal Occurrences for inclusion in the NUREG-0090 report to Congress.

6. AEOD Reports

No AEOD reports were issued regarding events occurring at Diablo Canyon during this evaluation period.

