U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report Nos: 50-275/85-08 and 50-323/85-09

Docket Nos: 50-275 and 50-323

License No: DPR-80

Construction Permit No: CPPR-69

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

Facility Name: Diablo Canyon Units 1 and 2

Inspection at: Diablo Canyon Site, San Luis Obispo County, California

Inspection conducted: February 14 - April 6, 1985

Inspectors: R J Dodds for — 4/18/85
M. M. Mendonca, Sr. Resident Inspector — Date Signed

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R. T. Dodds, Section Chief — Date Signed

Summary:

Inspection from February 17, 1985 through April 6, 1985
(Report Nos. 50-275/85-08 and 50-323/85-09)

Areas Inspected: Routine inspection of: Plant operations; maintenance and surveillance activities; Unit 2 preoperational test program; Unit 1 power ascension testing; Unit 2 systems turnover; followup of open items amd LERs; reactive inspection of significant operational events and allegations; independent inspection of licensed operator shift manning, generic concerns, EQ program, and GONPRAC meeting.

This inspection effort required 357 inspector-hours for Unit 1, and 303 inspector hours for Unit 2 by four resident inspectors.

DETAILS

1. Persons Contacted

*R. C. Thornberry, Plant Manager
*R. Patterson, Assistant Plant Manager/Superintendent
*J. M. Gisclon, Assistant Plant Manager for Technical Services
*W. B. Kaefer, Assistant Plant Manager for Support Services
*T. W. Rapp, OSRG Chairman
*W. A. Wogsland, Technical Assistant to NPO Manager
*D. A. Taggert, Supervisor of Quality Assurance
*C. L. Eldridge, Quality Control Manager
*R. G. Todaro, Security Supervisor
*D. B. Miklush, Supervisor of Maintenance
*J. A. Sexton, Operations Manager
*R. L. Fisher, Senior Power Production Engineer
*J. V. Boots, Supervisor of Chemistry and Radiation Protection
*O. E. Sundquist, Work Planning Center Supervisor
*W. B. McLane, Material and Project Coordination Manager
*L. F. Womack, Engineering Manager
*W. G. Crockett, Instrumentation and Control Manager
*T. L. Grebel, Regulatory Compliance Supervisor
*T. J. Martin, Training Manager
*R. S. Weinberg, News Service Representative
*J. M. Neill, Document Control Supervisor
V. R. Ray, Senior Power Production Engineer

The inspectors interviewed several other licensee employees including shift supervisors, reactor and auxiliary operators, maintenance personnel, plant technicians and engineers, quality assurance personnel, start-up engineers, and general construction personnel.

*Denotes those attending the exit interview.

2. Operational Safety Verification

a. General

During the inspection period, the inspectors observed and examined activities to verify the operational safety of the licensee's facility. The observations and examinations of those activities were conducted on a daily, weekly or monthly basis.

On a daily basis, the inspectors observed control room activities to verify compliance with selected limiting conditions for operation as prescribed in the facility Technical Specifications (TS). Logs, instrumentation, recorder traces, and other operational records were examined to obtain information on plant conditions, trends, and compliance with regulations. Shift turnovers were observed on a sample basis to verify that all pertinent information of plant status was relayed. During each week, the inspectors toured the accessible areas of the facility to observe the following:

(1) General plant and equipment conditions.

(2) Surveillance and maintenance activities.

(3) Fire hazards and fire fighting equipment.

(4) Radiation protection controls.

(5) Conduct of selected activities for compliance with the licensee's administrative controls and approved procedures.

(6) Interiors of electrical and control panels.

(7) Implementation of selected portions of the licensee's physical security plan.

(8) Plant housekeeping and cleanliness.

(9) The inspectors talked with operators in the control room, and other plant personnel. The discussions centered on pertinent topics of general plant conditions, procedures, security, training, and other aspects of the involved work activities.

b. Isolation of Safety Injection (SI) System Flow Transmitter

Flow transmitter FI-918 for train A of the SI system was discovered valved out-of-service by the inspector during an Engineered Safety Features (ESF) walkdown. Subsequent investigation by the Instrumentation and Control (I&C) department has resulted in no reasonable explanation for this condition. The flow transmitter instrument root valves were promptly returned to a normal configuration.

A recent Institute of Nuclear Power Operations (INPO) Significant Operating Experience Report (SOER) addressed "Valve Mispositioning Events Involving Human Error." SOER 85-2 (dated March 18, 1985) described several categories of valves whose mispositioning would not be readily apparent. In this specific case, the category of "root valves for an instrument whose reading does not change with changes in operating mode" directly applied.

The inspector attended the Technical Review Group (TRG) meeting which discussed the circumstances of this event, its investigation, and proposed corrective actions. Scheduled surveillance in February 1984 was identified as the last known authorized work activity affecting FI-918; an approved independent valve alignment verification had been performed at that time to return the transmitter to service. As corrective action, the I&C department has committed to the following: 1) A complete independent verification valve lineup of all critical sensors following the Unit 1 outage, and 2) creation of a list of key instruments of the types identified in SOER 85-2 for some frequecy of valve lineup verification. In addition, the General Operating Foreman issued a memo (dated 3/29/85) on the subject of "monitoring of control board

instrumentation for possible problems." Greater control operator awareness for unusual indications was emphasized as a good practice to prevent more serious consequences.

The inspector considers the resolution, review, and proposed corrective actions taken by the I&C and Operations departments concerning this event to be acceptable.

No violations or deviations were identified.

3. Event Followup

a. Reactor Trip from 100% Power

On March 21, 1985, at approximately 4:51 p.m. the Unit 1 reactor plant tripped from 100% power. The initiating signal was an open Reactor Coolant Pump (RCP) breaker with reactor power above 35% (P-8 Setpoint). This actuation was from an inadvertant actuation of a relay in the protection system.

During performance of trouble shooting activities on Refueling Water Storage Tank (RWST) level channel 921, the I&C technician accidently grounded an isolator in the circuit. This isolator was just recently installed as part of Regulatory Guide 1.97 channel modifications. This brief grounding caused a momentary pertubation of the PY-11 vital instrument 115 VAC power supply. Since PY-11 also supplies one protection set channel, this unintentional power loss resulted in an open RCP breaker position indication causing a reactor trip. Appropriate notifications and a reactor trip review were performed. Subsequently, the plant was returned to 100% power operation via normal operating procedures to support continued power ascension testing.

Following this event a TRG meeting was held to discuss causes, resolutions, and corrective actions. The inspector observed TRG deliberations. The primary cause was attributed to technician error. As immediate resolution, RWST channel 921 was restored to normal and returned to service. For longer term corrective action, the following was proposed: 1) Counsel the responsible I&C technican, 2) conduct a tailboard meeting and issue an I&C department memo discussing the event (emphasizing the vulnerability of I&C systems during troubleshooting, surveillance, or modification activities), and 3) issue a design change request to install fuses in all Regulatory Guide 1.97 isolators. Issuance of LER 85-012 will complete the licensee's reporting responsibilities.

Causes, resolution, and corrective actions identified during the TRG critique activities were considered appropriate and acceptable by the inspector.

b. Reactor Trip From Loss of Feedwater

The Unit 1 reactor was manually tripped from 48% power at 0415 on February 17, 1985, following a loss of both Main Feedwater (MFW) pumps.

Reactor power had been stabilized at approximately 48% with MFW pump 1-2 in operation. In preparation for raising reactor power above 50%, which requires both MFW pumps to be operating, MFW pump 1-1 was put into service to verify its operational performance capability. MFW pump 1-2 was unloaded and left free rolling in a hot standby condition. As feed flow stabilized in support of a 48% power steam demand, MFW 1-1 tripped on indication of high thrust bearing wear. Operators immediately ran up standby MFW pump 1-2 to pick up lost feedwater flow. During the subsequent transient to recover feedwater flow, MFW pump 1-2 also tripped on high thrust bearing wear. Upon loss of all MFW supply, operators manually tripped the reactor plant well before reaching the automatic feedflow-steamflow mismatch at the low Steam Generator (SG) water level trip setpoint. Prompt operator assessment and action precluded a significant depletion of SG water inventory and challenge of the Reactor Protection System.

Inspection of both MFW pumps by the on-site I&C department revealed no thrust bearing damage. Trip setpoint calibration of the thrust bearing wear detection system was verified at 10 mils of shaft movement. I&C determined this setting was overly conservative and adjusted the MFW pump trip setpoint for a thrust bearing indication wear of 18 mils of shaft displacement in accordance with new Westinghouse specifications. Two design change requests were also initiated, in response to Westinghouse recommendations, which would delete the reverse motion trip feature and also incorporate a time delay (0.5 seconds) to prevent inadvertent trips from potential electrical spiking.

This operational event and subsequent I&C follow-up were discussed in a scheduled TRG meeting, which the inspector attended. The inspector has reviewed the identified causes, resolution, and corrective actions which have been documented in a Non-Conformance Report (NCR). Furthermore, during the course of event follow-up, the inspector also reviewed abnormal operating procedure (OP) AP-15, "Loss of Feedwater Flow." A concern over the insufficient scope of OP AP-15 to provide adequate operator guidance during this event was discussed with the operations departments, senior power production engineer and plant management. As a result, the licensee has agreed to resolve the limited scope of OP AP-15 by procedure revision and plans to implement a complete update of all abnormal procedures. Follow-up of this activity will be conducted during the normal inspection process.

The prompt response by plant operators and corrective actions described above were considered by the inspector to acceptably address this operational event. Timely issuance of Licensee Event

Report (LER) 85-011 completed the licensee's reporting responsibilities.

This event also resulted in damage to eight snubbers on the number 1-2 feedwater bypass line. These snubbers were determined to be inoperable due to a water hammer caused by the transient. The licensee examined other lines that could have been affected and observed no other snubber damage. Licensee analysis has determined the water hammer only occurred in this feedwater bypass line because of its unique configuration.

It was not until March 7, 1985. that the licensee discovered one of the snubbers was inoperable, during routine surveillance. The other seven were identified as inoperable on March 8, 1985. Feedwater bypass line number 1-2 was subsequently isolated, by closing its regulating valve, and a safety analysis of the situation was immediately made. The licensee has since implemented a program of supplemental snubber inspections, to provide added assurance of prompt discovery of potentially inoperable snubbers.

The licensee also analyzed the effect of the damaged snubber on systems interaction, jet impingement/pipe break, safety related piping integrety, and operability of the feedwater bypass regulating valve. No adverse effects were identified by this engineering analysis.

The inspector confirmed these findings by independent observations of the feedwater number 1-2 bypass line configuration and review of the feedwater bypass regulating valve safety function.

c. Radiation Protection Aspects of Sodium Tracer Tests

Tests were conducted on March 17 and 19, 1985, to evaluate feedwater heater leakage and steam generator moisture carryover, respectively. These tests monitored the progression of liquid sodium-24 tracers throughout the system. Comparison of radiation levels, monitored at particular points, allowed plant engineers to determine the magnitude of leakage and carryover. The following is a sequenced description of several contamination events reconstructed from discussisons with Chemistry and Radiation Protection personnel (Manager, Senior Engineer, and Engineers and Technicians involved in the incident).

For these tests, a soduim-24 ampul was removed from its shielded casks with tongs and broken into a 55 gallon drum to dilute the sodium-24 with water for injection into the feedwater system. During this process, for the first test on March 17, the ampul was inadvertantly dropped onto a cart used for movement of the casks. The ampul was then picked up with tongs, placed into the drum, and the test initiated as expected.

In order to survey the cart and casks for radiological contamination, the cart was moved to the radiological control point, away from the background source (the sodium-24). The survey of the cart found 200 to 300 counts per minute (CPM) of contamination on

the wheels; a smear sample of the point where the ampul hit the cart found approximately 100 m Rad/hr.; one of the personnel involved in the movement of the cart had approximately 2,000 CPM of contamination on their shoe; another had contamination of approximately 100 CPM on his finger tips. The personnel contamination was detected during the individual survey for egress from the radiological controlled area. These contaminations were contained and allowed to decay to acceptable levels, cleaned up, or disposed of as radiological waste.

To assure that contamination had not been spread by the carts movement to the radiological control point, radiological surveys of the route were performed. No contamination was found, except at the radiological access area where the cart was located. This area was readily cleaned up and disposed of as radiological waste.

The casks that contained the ampul were surveyed for contamination. Contamination was found on the innermost cask of the three. This contamination appeared to be consistent with contamination observed on the cart. The manufacturer of the sodium-24 source indicated it was common for these sources to have contamination external to the ampul (similar contamination was observed on the source used in the test of March 19, 1985). Radiological surveys of the other casks found some contamination. All aformentioned contamination was controlled and disposed of as radiological waste. The casks were shipped back to the manufacturer of the source as a non-radiological controlled shipment. Additionally, the Vendor Inspection Branch of the NRC was informed of the incident.

Observations by the inspectors, during the conduct of the second test, found that normal radiation control practices had been instituted for areas where the sodium-24 would be a radiological consideration. Access control and radiological survey procedures were established. This was also verified to be the case for the test on March 17, by discussions with Chemistry and Radiation Protection personnel. The entire turbine building was treated as a radiological controlled area with work beginning as early as Friday, March 15, to reduce leakage, establish radiological boundaries, shield areas, and prepare for potential decontamination.

d. Component Cooling Water (CCW) Surge Tank Overflow

During a 45 minute period, approximately 4,400 gallons of CCW discharged from the Unit 2 CCW surge tank relief valve into the auxiliary building sump. This occurrence was the result of improper valve alignment during restoration-to-service of a surge tank level instrument.

I&C personnel had manipulated the instrument isolation valves, as necessary, to perform calibration activities on the surge tank level transmitter, level control and indication instruments. This instrument and associated instrument isolation valves are connected to a standpipe which is connected to the surge tank by two

root valves (one at the top of the standpipe and another at the bottom). In order to calibrate the transmitter and instruments, the standpipe root valves were closed, and the water makeup to the tank was isolated in accordance with clearance number 14-12488-85. Upon returning the transmitter and instruments to service,the standpipe root valves were opened and makeup water flow to the surge tank was re-established. However, the level control instrument was inadvertly left isolated from the standpipe, as a result of communication problems between I&C and operations personnel.

Due to this configuration, a flow control valve which supplies makeup water to the CCW surge tank failed to close. This caused the surge tank to over-fill, lifting the relief valve, and discharging chromated water into the auxiliary building sump.

Calibration of these non-safety related surge tank instruments was performed in accordance with a Shop Work Follower and I&C loop test procedures (rather than Surveillance Test Procedures). These loop test procedures do not specify valve positions or require independent verifications when returning equipment to service. The need for an Incident Review Board to assess this event and recommend corrective action is being evaluated by the licensee.

A related sample considering a boric acid spill was described in section 5.i of NRC Inspection Report 50-275/84-21.

The inspector will follow-up on this issue as part of the routine program.

No violations or deviations were identified.

4. Maintenance

a. Mechanical Overhaul of Diesel Generator (DG)

The inspector observed selected portions of maintenence activities on the Unit 2 DG 2-2. The DG was acceptably cleared in accordance with clearance number 21-11093-85. Maintenance consisted of a major overhaul in accordance with Surveillance Test Procedure (STP) M81. Starting air motors were rebuilt in accordance with the procedure. Replacement of the radiator cores was also observed by the inspector. Finally, the inspector observed the licensee's examination of the cylinder walls. Acceptable cleanliness and tool control were observed for these maintenance activities, as well as completion of quality control hold points.

b. Routine Preventive Maintenance (PM) of Containment Spray Pump (CSP) 1-1 Overcurrent Relay

As part of a scheduled electrical PM for CSP 1-1, the overcurrent relays for all three power supply phases were removed and tested. Work order number 2-12-5981 outlined the scope of work activity and referenced appropriate procedures containing the necessary detailed instructions. Clearance number 12-964-85 defined the electrical

work boundary of equipment taken out of service, established clearance points for safety and system isolation, and provided notice for operations of component inoperability.

The inspector reviewed all of the aforementioned documents, walked down clearance points, and witnessed the step-by-step testing of the overcurrent relays in accordance with electrical maintenance procedure (MPE) 50.4 "Routine PM of Non-Directional Overcurrent Relay Type IAC."

As prescribed by MPE-50.4, an I&C technician tested the following overcurrent relay characteristics: 1) Relay contact closed from disc creep at tap setting, 2) relay contact did not close from creep when test current at 5% less than tap setting, 3) creep time response to close relay contact for specific test current multiples of tap setting, and 4) instantaneous overcurrent trip setting. The inspector verified test data and independently compared the contact closure time response data with recommended curves contained in General Electric Instruction 28818B for IAC type overcurrent relays. All test equipment and apparatus used were within the calibration due date and appeared to be connected correctly.

c. Unit 2 Electrical Maintenance (EM) of DG 2-2

Following turnover of Unit 2 DGs to Nuclear Plant Operations (NPO) from General Construction (GC), an extensive overhaul evolution involving the mechanical and electrical maintenance departments were developed by NPO. The inspector reviewed shop work follower (SWF) EM-2-84-036 for DG 2-2, which outlined work activities covering various electrical PMs and the 18 thru 90 month electrical maintenance inspections and services described in STP M-81, "Diesel Engine Generator Inspection." As part of the SWF package, the inspector also reviewed Quality Control Instruction 84-1409 and 85-0368, clearance 21-11694-05, and several electrical maintenance procedures.

Performance of step 5 to SWF EM-2-84-036 was conducted in accordance with MP 1.19-1, "Diesel Generator Tach Pack & RPM Indicator Calibration Check," and witnessed by the inspector. Some of the specific aspects verified by the inspector included: Testing equipment within calibration due date, "as found" and "as left" surveillance data, step-by-step procedure conduct, and instrument adjustments made to meet acceptance criteria.

From the scrutiny of this maintenance evolution, only one minor discrepency was identified. Two man-on-line tags listed as clearance points were not hanging on the required vertical board controls in the Unit 2 control room. This concern was brought to the shift foreman's attention and promptly resolved. Concern for consistent, controlled Unit 2 maintenance activities was stressed by the inspectors with plant management.

d. Residual Heat Removal Sump Pump Motor 1-4 Corrective Maintenance

Selected portions of the subject maintenance activity were observed by the inspector. Work was performed in accordance with SWF EM-1-85-060, which was issued in response to a Nuclear Plant Problem Report. This work removed Electrical Metallic Tubing locknuts and replaced them with rigid locknuts to improve power cable attachment characteristics. The motor was cleared in accordance with clearance number 19-1309-85. Acceptable cleanliness and tool control was observed, as well as, material requisition forms.

e. Thermal Overload Relays

The inspector witnessed maintenance and testing of the thermal overload relays on the Unit 1 480 VAC vital bus G circuit breakers. The entire 480 VAC bus G was cleared, and each electrical phase of the overload relays were separately tested. A specified current was applied to the overload heaters, and the relay tripping time was then compared with the trip time range acceptance criteria. If the relay failed to trip within the specified range, the overload heater was replaced.

The inspector also observed replacement of a defective circuit breaker in accordance with Shop Work Follower EM-1-85-067. Required administrative approvals for performing the work had been obtained, and the activity was being accomplished by qualified personnel. The performance of established QC hold points was observed.

f. Diesel Generator 1-2 Starting Air Compressor

Selected portions of preventive maintenance of the subject air compressor were observed by the inspector. The air compressor was cleared, housekeeping was acceptably established, and work was conducted in accordance with an approved shopwork follower. Replacement material was properly certified and verified by QC. Redundant components were operable and Limiting Conditions of Operation were satisfied.

No violations or deviations were identified.

5. Surveillance

By direct observation and record review of licensee surveillance testing, the inspectors verified compliance with TS requirements and implementing plant procedures for the following items.

a. Nuclear Power Range Channels Calibration by Heat Balance

The inspector observed that the subject heat balance was conducted in accordance with STP R-2B. Plant system data was accumulated, and used to calculate reactor thermal power level.

The calculation was performed by a licensee verified computer

program. The differences between the nuclear power range channels reading and the calculated values were large enough to require adjustment of each channel. These were performed in accordance with STP R-2B. Adjustments were conducted by the Shift Technical Advisor and reveiwed by the Shift Foreman.

b. Routine Daily Checks

The inspector observed the performance of STP I-1B "Routine Daily Checks Required by Licenses ". The systems that require daily checks be preformed per TS are verfied by this STP. The reactor was in Mode 1 at 75% power when this STP was performed. The STP was performed satisfactorally and was approved and reviewed by the appropriate licensee personnel.

c. Instrument AC Power Supply Functional Test

The inspector observed the licensee's performance of STP M-14 "Instrument AC Power Supply Functional Test." The STP was performed on Unit 2 inverter 2-4, which supplies 120 VAC power to vital instrumentation and control systems. In order to perform the STP, the inverter was removed from service and 120 VAC instrument distribution panel 2-4 was transfered to an interruptable backup power source. The test was generally conducted in accordance with the STP. However, the inspector identified that required information pertaining to test prerequisites, and test precautions and limitations, was not documented on the STP data sheet as required by the procedure. Additionally, when the 120 VAC distribution panel was placed on the backup power supply (transferred from an uninterruptalbe to an interruptable power supply), this information was not properly recorded by the Unit 2 control operator. Accordingly, subsequent operating shifts were not aware that the distribution panel was being supplied from a backup power source.

As a result of discussions held with plant management, the inspector was informed that corrective actions would be initiated to assure that maintenance personnel properly follow and document completion of procedural steps during testing. Furthermore, Unit 2 operations personnel will be instructed to exhibit the level of attention to detail that is characteristic of Unit 1 operations personnel (even though no nuclear fuel is in the Unit 2 reactor).

d. Measurement of Station Battery Pilot Cell Voltage and Specific Gravity

The inspector observed surveillance testing of the Unit 1 and Unit 2 station batteries, which was conducted in accordance with STP M-11A. The routine surveillance test consisted of verifying the electrolyte level, specific gravity and cell voltage of each pilot cell; additionally, the overall voltage of the station batteries were measured. The inspector monitored the step-by-step surveillance activities and verified that the activities were performed in accordance with STP M-11A.

e. RWST Level Channel Surveillance and Modification

As part of the modification to fulfill Regulatory Guide 1.97 license condition requirements, design changes DC 1-EE-27386 and 29867 were issued to "Install isolators in Hagan Racks as directed by NPO I&C Department." SWF TI-1-85-068 was used to outline the work activity necessary to make the design change modifications for RWST level channel 922.

The inspector reviewed all the paperwork associated with this I&C activity which included the aforementioned documents, clearance 9-1247-85, Quality Control Instruction 85-0274 and STP I-48 "Calibration of RWST Level Channels 920, 921, & 922." Circuit modifications, isolator installation and QC hold point verifications were performed by GC personnel and witnessed by the inspector. Subsequent calibration of RWST channel 922 which was conducted by NPO I&C technicians, was also witnessed by the inspector. The "as left" calibration data, taken in accordance with STP I-48, demonstrated that the indicated channel response had shifted slightly beyond the required accuracy criteria. Adjustments were made by NPO I&C and the following "as left" calibration data was verified as acceptable.

During modification work, the inspector perceived that a specific alteration identified in the design change circuit diagram would effect a control module outside the clearance scope; this concern was brought to the NPO I&C technicians attention, and was promptly resolved. Subsequent discussions between the inspector and responsible I&C technicians, foremen and general foremen, resulted in a satisfactory disposition of this concern and its ramifications.

f. Gaseous Radwaste Oxygen Analyzer Functional Test

The inspector observed licensee technicians performing the subject functional test in accordance with STP I 79A. The technicians determined there was a problem with instrument readings, or test hookup, during conduct of the test. They stopped work activities, investigated the problem, requested assistance from their supervisors, and suspended work until the arrival of required replacement parts.

g. Vital 480 V Circuit Breakers

The inspector observed selected portions of testing of the 480 V vital bus "G" circuit breakers. The technicians conducted the test in accordance with Electrical Maintenance Procedure E 51.4. This testing is performed during bus outages with breakers in situ. The bus was cleared, acceptable housekeeping was established, and previous test results were available for reference.

The overcurrent trip function of the breakers was tested. The inspector questioned the technicians and engineers to determine their understanding of the procedure and breaker function.

No violations or deviations were identified.

6. Routine Inspection

a. Procurement Control Program

The inspector reviewed the licensee's procurement control program. The inspector examined Nuclear Plant Administrative Procedures (NPAPs) pertaining to procurement, the Qualified Suppliers List (QSL) and procurement records as part of this inspection.

In reviewing the NPAPs, the inspector found two instances of procedures referencing deleted procedures. Both items had been previously identified by the licensee and are currently being addressed. The inspector identified several suppliers, on the February QSL, which had exceeded their expiration date by greater than 90 days. The March QSL had deleted these suppliers or requalified them by reauditing. Implementation of procurement document control, as well as the timeliness of NPAP and QSL updates, will be followed as part of the routine inspection program.

The inspector examined procurement documents on a sampling basis to verify compliance with licensee Quality Assurance QA commitments and administrative procedures. Several safety related procurement document files did not contain a procurement classification checklist when reviewed; however, the checklists were found in a group of documents yet to be filed.

The licensee has recently established an on-site Procurement Specialist Group which is responsible for ensuring that procurement documents and changes to them are processed, reviewed, and approved in accordance with the NPAPs concerning procurement. The Procurement Specialist Group was in the process of being staffed to perform its function.

b. Records Control Program for Units 1 and 2

Regulations to assure "sufficient records shall be maintained to furnish evidence of activities affecting quality" are described in Section XVII of Appendix B to 10 CFR 50. Regulatory Guide 1.88 has since endorsed ANSI N 45.2.9-1974, "Requirements for Collection, Storage, and Maintenance of QA Records", as an acceptable basis for complying with the regulations of Appendix B. The licensee has committed to a records control program which meets the requirements and guidelines of ANSI N 45.2.9-1974.

In addition to the record retention requirements of 10 CFR 50 Appendix B and ANSI 45.2.9, the Diablo Canyon Power Plant (DCPP) TS identify all types of quality operating records that shall be specifically maintained by the licensee.

In the Final Safety Analysis Report (FSAR) and policy section of the PG&E Company QA manual, responsibility for collection, storage, and maintenance of completed QA records from construction and operation

activities of Units 1 and 2 have been assigned to the Record Management System (RMS). A RMS handbook has been issued to outline the necessary guidance for all PG&E and project personnel, for implementing the general requirements of the FSAR and QA manuals. This handbook not only establishes programatic records control guidance for the company wide RMS, but also provides working instructions for transmitting, indexing, entering, and retrieving records in the RMS.

The RMS handbook has been applied to the DCPP (Units 1 and 2) by use of unique nuclear plant administrative procedures (NPAP). These procedures have not only established requirements for on-site implementation of RMS guidelines, but also provided other necessary instructions and department responsibilities for control of all identified QA records.

The primary goal of this inspection was to (1) asertain whether the licensee's on-site NPO organization has developed, established and implemented a program for controlling quality operating records generated by Units 1 and 2 activities and (2) verify this program was in conformance with regulatory requirements of, App. B to 10 CFR 50, guidelines of ANSI Standard N 45.2.9-1974, and committments of the FSAR and QA manual. Control of construction records by GC, startup (S/U) and contractor organizations was also reviewed,to a lesser degree, by the inspector (as these records have been scheduled for on-site incorporation into RMS).

To evaluate the QA program of DCPP Units 1 and 2 related to control of records the inspector conducted a detailed review of the following:

- Appendix B of 10 CFR 50, "QA Records"
- ANSI Standard N 45.2.9-1974
- Updated FSAR Section 17.17, "QA Records"
- TS Section 6.10, "Records Retention"
- QA Manual for Nuclear Power Plants
- GC QA Programs Section 13.1, "QA Records"
- NPAP E-1 Revision 3, and NPAP E-1S1 Revision 7, "Requirements for Retention and Extended Storage of Operation Phase Activity Records"
- NPAP E-5 Revision 2, "Requirements for Handling and Storage of Operation Phase Activtiy Records While In Use"
- NPAP E-6 Revision 1, "Plant Logs"
- NPAP E-750 Revision 4, "Maintenance Records"

- General Construction Project Quality Control Instruction (QCI) - H-2 Revision 0, "Vault Filing System"
- QCI-4 Revision, "Contractors' Record Turnover"
- Instruction to Start-up Engineers No. 3.7
- QA Records Program Audit No. 83164 dated September 26, 1983
- QA Records Program Audit No. 84316P dated December 26, 1984

The following is a list of the more significant inspection activities conducted by the inspector inorder to assess the adequacy of QA records control program implementation:

- Interviews of the Document Control Supervisor and analysts, clerks responsible for indexing/transmitting to RMS from various NPO departments, several NPO department managers, RMS backfit project supervisor, GC QC supervisor and custodian, startups lead engineer and records clerk, and Pullman QA records supervisor and custodian.
- Inspected NPO, GC, and Pullman extended storage facilities for master microfilm reels and all non-microfilmable records.
- Performed walk throughs of the RMS processes conducted by document control and the backfit project for indexing, filming, entry, independent QC review, and return of records to applicable organizations.
- Inspected temporary record storage facilities and records of the Training, I&C, Operations, and Maintenance Department.
- Retrieved selected records from the RMS system and the NPO, GC and Pullman storage vaults.
- Cross referenced records contained in RMS and the various vaults to the established indexes.

Based upon an evaluation of all of the aforementioned inspection and review activities, the inspector has determined that the RMS program used to control operations and construction QA records meets, and in many areas exceeds, the requirements and guidelines prescribed by regulation and industry standard. Futhermore, implemenation of this program has been effectively conducted in accordance with the RMS handbook and written administration procedures, except for the minor areas discussed later. The permanent record storage facilities (vaults) established by NPO, GC, QC, and Pullman for QA records which have not been micro-filmed were considered to acceptably meet the criteria of ANSI N 45.2.9-1974. Maintenance and operation of these facilities, by NPO and GC, for control and storage of records was acceptable.

Consideration of the need for improvement in the following subject areas was discussed with responsible licensee management:

a) Extensive backlog of Training, I&C and Startup department records which have not been entered into RMS

b) Temporary storage of I&C and Operation department records in non-fireproof file cabinets

c) The Retention and Entry Schedule of NPAP E-1S1 requires updating to be consistent with TS and RMS handbook, and to delete obsolete procedure types

d) NPO AP requirements do not prescribe what are considered as acceptable time periods for each department to support "timely" transmittal of records to RMS

e) Confusion of S/U record control responsibilities between GC, QC and Startup department

Prompt and agressive responses, particularly from the document control and I&C departments, have effectively resolved or addressed all the inspectors issues pertaining to NPO. Resolution of startup record control deficiencies will be followed-up in the routine inspection process.

In overview, RMS appears to represent a satisfactory program for storage and retrieval of historical QA records. The inspector discussed with plant management the need for increased training and familiarity of key personnel on the use and capabilities of RMS in order for the DCPP organization to fully exploit this system.

No violations or deviations were identified.

7. Unit 1 Power Ascension Test

a. Plant Trip From 100% Power

The inspector witnessed performance of Unit 1 Startup Test Procedure (TP) No. 43.4 " Plant Trip From 100% Power." The purpose of the test was to verify the ability of the primary and secondary plant to sustain a unit trip from 100% power, and to bring the plant to stable conditions following the transient. Data obtained during the test was also to be evaluated to determine if changes in control system setpoints was necessary in order to improve transient response of the plant. With the plant on automatic control at 100% power, the plant trip was initiated by tripping the turbine from the control operator's console. Based upon observation of control room indications during the transient, the inspector concluded that the safety and control systems performed generally as designed. From those observations, this test satisfied FSAR chapter 14 commitments for turbine trip (plant trip) testing. Final determination of control system response is contingent upon data analysis by the

licensee that will be reviewed by the inspector under the routine program.

b. Natural Circulation Boron Mixing Test

TP 42.7 "Natural Circulation Boron Mixing Test" was conducted coincidently with TP 43.4 once the plant was stabilized at Hot Standby (Mode 3) conditions. All reactor coolant pumps were tripped, natural circulation conditions were established, and approximately 900 gallons of 12% boric acid was injected into the reactor coolant system (RCS) from the boron injection tank. Boron concentration was sampled every twenty minutes to verify boron mixing in the RCS. Having been on natural circulation cooldown for over 4 hours, and upon reaching a stable boron concentration, the RCS was cooled down using the 10% atmospheric steam dumps. When RCS temperature was reduced to less than 350 degrees F, the RCS was depressurized, and the RCS was brought to a cold shutdown condition (Mode 5) utilizing the residual heat removal system. Successful completion of the test concluded the Unit 1 Power Ascension Test Program. NRR will review these test results as part of their evaluation of generic Westinghouse plants natural circulation capabilities.

c. Net Load Trip from 100% Power

At 6:30 a.m. of March 23, 1985, the licensee initiated a 100% net load rejection of Unit 1 in accordance with S/U TP 43.2. Both Diablo Canyon units are 4-loop Westinghouse Pressurized Water Reactors with designed capability of total off-site net load rejection. During the startup test, power supply of unit house loads amounting to approximately 5% of total capacity was maintained from the main generator output. Successful performance of S/U TP 43.2 was witnessed by the inspector.

Net load rejection was accomplished by opening the main transformer high side breakers while the plant was stable at 100% rated thermal power and on automatic control. Just prior to test initiation, the inspector verifed selected test prerequisites and initial plant conditions, minimum crew requirements, and special test recorders. Test and operation personnel conduct during performance of S/U TP 43.2 appeared to be correct, timely, well coordinated, and in conformance with procedure instructions. Preliminary assessments and observations by the inspector concluded that plant performance was sufficient to meet the following identified acceptance criteria:

1. Reactor and turbine did not trip
2. No safety injection was initiated
3. Main steam and pressurizer safety valves did not lift
4. Minimal operator intervention

A final, complete analysis of all data will be performed by the licensee to evaluate plant performance versus acceptance criteria, control systems interaction, and potential control systems setpoint

changes for improved transient response. This analysis will be reviewed in the routine inspection program.

A corollary event occured during this test which has received attention from the public. Several sheet metal sections of the outside turbine building skin were stripped away when the 35% atmospheric steam dumps lifted. Steam dump actuation created a venturi effect of high velocity steam along the side of the turbine building wall, causing a low pressure area to occur. Since the turbine building siding was designed to pull away under small pressure differentials, several sections came off. Once in the steam dump discharge, these pieces (primarily 4 ft. x 10 ft. in size) were hurled throughout the site.

Subsequent investigation into this event by Onsite Project Engineering Group (OPEG) has revealed the following:

- Safety related equipment was not adversely affected
- There was no resultant health hazard
- There was no significant impact on plant operations
- This event did not demonstarte a condition of unreviewed safety significance (this situation has been enveloped in the licensee's analysis for tornadoes).

To preclude recurrence, various alternative corrective actions were pursued by general office engineering. Among these, are considerations for stiffening the sheetmetal or more likely, the installation of pressure equalizing louvres.

OPEG's preliminary analysis and conclusions are considered reasonable by the inspector. Followup of corrective actions and a detailed safety evaluation by general office engineering will be followed up during normal inspection activities.

No violations or deviations were identified.

8. Unit 2 Preoperational Program

a. Unit 2 System Turnover

The licensee has implemented a Startup Open Items List (SOIL) to track testing and work activities during final preparations for plant operation of Unit 2. This list identifies which problems affect system operability and require resolution prior to turnover from GC to the NPO department. The licensee has also specified which systems and startup tests are required to support fuel load.

The established goal to complete all systems prior to fuel load has been encouraged so that system operability can be more readily controlled and assured. During the past several weeks, a substantial quantity of SOIL items have been resolved. At this

time, SOIL provides a reasonable tabulation of testing and work yet required for fuel load and subsequent operation.

System operability requirements have been established by NPO. Mode transition checklists are used to ensure all the TS required systems will be operable as necessary in each mode of operation. These measures by the licensee have established a program of system operability verification in accordance with TS and are identical to those implemented on Unit 1.

As of the end of this inspection period, NPO has formally accepted nine Unit 2 systems from GC: Diesel generators, hydrogen/nitrogen, nuclear instrumentation, plant computer and annuciator, 12 KV power, 120 V instrument AC, reactor control rod, reactor coolant system, and containment spray systems. Additionally, startup has released 12 more systems, i.e., sent completed turnover packages to NPO for review and acceptance. The intent of this slow, methodical, turnover procedure has been to essentially complete all open SOIL items with particular emphasis given to those systems necessary for support of licensing and fuel load.

The inspectors will continue to follow-up the resolution of SOIL items and preparations for Unit 2 fuel load and power ascension under the routine inspection program for startup.

No violations or deviations were identified.

9. Independent Inspection

a. Turbine-Driven Auxiliary Feedwater Pump Overspeed Trip Generic Problem

An internal NRC Region II memorandum, dated February 22, 1985, from R. D. Walker, described a condition observed at Crystal River where leakage through the steam supply valve to the turbine-driven auxiliary feedwater pump caused uncontrolled shaft rotation. This turbine shaft rotation caused an increase of control oil pressure in the turbine governor speed setting cylinder such that the governor was unable to prevent an overspeed trip of the turbine-driven pump on startups.

The licensee at Diablo Canyon had previously observed similar problems related to restart of the turbine-driven auxiliary feedwater pump after testing. Procedures were then instituted to reduce control oil pressure in the speed setting cylinder after testing and operation. Furthermore, in direct response to this memorandum, the licensee revised surveillance and operating procedures in order to assure rotation of the turbine, due to leakage through the steam supply valve, will not result in an overspeed trip.

b. Shift Manning

10CFR 50.54 requires at least 2 licensed senior operators and 3 licensed operators for two units in operation from a common control room. As of April 14, 1985, the shift crews will exceed the regulatory requirements for two unit operation with two shift foreman (licensed Senior Reactor Operators, SROs), one senior control operator (a licensed SRO), two control operators (licensed reactor operators), and a Shift Technical Advisor (a licensed SRO). Review of current watch lists by the inspector for both units indicates the licensee is in compliance with regulatory requirements and proposed technical specifications, which included a Shift Technical Advisor in accordance with TMI task action plan (NUREG-0737) which can be fulfilled by another licensed postition in accordance with Technical Specifications.

The licensee plans no change to the licensed operating crew configuration except to supplement crews with newly licensed operators. Additionally, licensee operations management has reiterated their conservative approach to limit all activities commensurate with manning resources. This has been done with relative success in the past during Unit 1 startup. Licensed individuals may continue to be called out from training and engineering to fill or supplement key positions when plant conditions warrant or on-shift supervision is implemented. This policy provides added assurance that Unit 2 activities will be performed in a safe, controlled manner.

c. General Office Nuclear Plant Review and Audit Committee (GONPRAC) Meeting (Closed 84-27-02)

The inspector attended a on-site GONPRAC meeting on March 12, 1985. This meeting was conducted in accordance with approved Nuclear Power Generation procedure 5.13. All regular members, except for one alternate, were present to satisfy Technical Specification quorum requirements. GONPRAC members reviewed all identified subject areas required in the Technical Specifications and generic problems.

In addition, the GONPRAC chairman emphasized the importance of timely disposition of Onsite Safety Review Group (OSRG) findings with the Diablo Canyon Plant Manager. Implementation of this policy was demonstrated during the meeting by subsequent GONPRAC support of an OSRG finding. The inspector considers GONPRAC's direct involvement and support of OSRG recommendations as acceptable to close unresolved item 84-27-02.

d. Environmental Qualification (EQ) Program

The inspector reviewed the licensee's EQ program for compliance to regulation 10 CFR 50.49 and Regulatory Guide 1.89. The licensee's Nuclear Plant Administrative Procedures C-451 "Maintenance of Environmental Qualification (I&C Dept)," and D-756 "Maintenance and Surveillance of Electrical Environmentally Qualified Equipment," were reviewed to assure an acceptable EQ program.

These procedures reference plant drawing 050909 which lists all electrical and I&C devices by manufacturer, model number, design class, Q listing reference, seismic qualification, and enviromental qualification. From drawing 050909, environmental qualification requirements for selected equipment were noted and verified to be consistent with the requirements for preventive maintenance and surveillance testing of selected equipment.

This program further requires any EQ equipment, work, and documentation to be specifically labeled as EQ; additionally, the program required training in the EQ procedures, as well as, updating and failure trend analysis. The licensee has planned for full implementation of the EQ program by March 31, 1985. This date is consistent with an understanding between the NRC's Office of Nuclear Reator Regulation licensing project manager for Diablo Canyon and PG&E cognizant engineering group.

e. Station Battery Installation, Operation and Maintenance

J. M. Taylor's (NRC) February 26, 1985, memo to the NRC Regional Administrators on the subject of "Station Battery Operation and Maintenance," identified several deficiencies previously existing in the installation, operation and maintenance of station batteries at several nuclear facilities. In response to this memo, the inspector evaluated the condition of the Unit 1 station battery. Items evaluated included 1) the physical installation (such as battery supports, battery fluid level, cleanliness, cell integrity, lack of terminal corrosion and cell sediment, etc.) and 2) battery records (such as float voltages, performance of service tests, specific gravity measurements, equalization charges, full capacity tests, etc.). Additionally, the inspector witnessed the performance of STP M-11A "Measurement of Station Battery Pilot Cell Voltage and Specific Gravity." The inspector verified that 1) the acceptance criteria of STP M-11A was met, 2) the requirements of Technical Specification Surveillance Requirement 4.8.3.1 "Electrical Power Systems - D. C. Sources" have been complied with, and 3) the recommendations contained in J. M. Taylor's memo are being instituted for the Diablo Canyon Unit 1 station batteries.

No violations or deviations were identified.

10. Allegation Followup

Task: Allegation or Concern No. 152

ATS No: RV-84-A017

a. Characterization

Concerns with installation of P 1331 conduit clamps. Three specific concerns were identified: 1) P 1331 inner bolts cannot be torqued to the specified torque; 2) the torque relaxes after several days; and 3) the torque values specified are excessive.

b. Implied Significance to Plant Design, Construction, or Operation

Improper installation of P 1331 conduit clamps might result in raceway supports being incapable of performing their intended functions.

c. Assessment of Safety Significance

The staff verified that, prior to this allegation, the licensee had identified electrical raceway supports that were not torqued to values required for seismic design conditions. The licensee subsequently issued 1625 torque modification packages for Unit 2 raceway supports to correct these deficiencies. During the implementation of the torque modification program, the licensee identified 159 torque modifications that could not be accomplished as originally specified.

Additional engineering analysis was required on these torque modifications, 78 of which involved P 1331 clamps. Original torque modifications required all clamp bolts regardless of position, inner or outer, to be torqued to the value required for the critical load-bearing bolt or bolts on the clamp. Subsequent torque modifications identified the specific bolts that required torquing and either an alternative method to torque the inner bolts if they were load-bearing or other methods to accomplish seismic hardening of the clamps such as increasing the torque on other bolts, or welding. The staff reviewed the revised torque modifications on a sampling basis to ensure that the inner bolt torquing concern was identified and adequately addressed by the licensee.

The staff determined that the second concern regarding bolt relaxation was addressed by the licensee prior to implemention of original torque modifications. The licensee contracted ANCO Engineers Inc. to conduct tests to determine the slip-resistance capacity of bolted connections for various nut types and bolt torques. These test results were utilized by the licensee in preparing the original torque modifications. The inspector reviewed portions of the ANCO Engineering's Test Report which verified no significant bolt relaxation was observed during testing.

It was also determined that the third concern stating the torque values specified are excessive was addressed by the licensee prior to receipt of this allegation. When the higher "excessive" torque value of 85 ft-lbs was required by engineering analysis, a Design Change Notice (DCN)was issued which included a hardware change to bolts that had been tested for both slip-resistance and torque relaxation at this higher torque. The inspector verified that the DCNs included such hardware changes.

d. Staff Position

The staff found that the licensee properly identified and dispositioned these installation concerns prior to the allegation

and there is acceptable assurance that raceway supports were properly installed. Furthermore, in Section 6 of Supplemental Safety Evaluation Report No. 29, March 1985, the staff concluded, that the methods used by the licensee to evaluate electrical raceway supports including actual bolt torque levels, were acceptable.

e. Action Required

No further action is required.

Task: Allegation or Concern Nos. 1652 and 1653

ATS NO: RV-84-A122

a. Characterization

Installation, inspection and testing of seals in crane wall (inside containment) and auxiliary building penetrations were performed by personnel who were not properly trained. Indoctrination records were falsified.

b. Implied Significance to Plant Design, Construction or Operation

The subject penetration seals perform one or all of the following functions: 1) radiation shielding, 2) hydrostatic/air sealing and 3) fire barrier sealing. Unsatisfactory penetration shielding could result in increased personnel radiation exposure or unanticipated damage to safety related equipment (as a result of fires or steam line breaks).

c. Assessment of Safety Significance

In responding to a Hot-Line concern, as documented in Quality Concern Summary Report-110, the licensee held additional conversations with the concerned individual. The individual indicated that he did not intend to imply that training records were falsified. Instead, he clarified that training of Promatec installation, inspection and testing personnel was not adequate.

The licensee's findings from their review of the individual's concern concurred that further onsite training and indoctrination of Promatec craft personnel was necessary. Accordingly, all Promatec personnel were directed to attend QA orientation classes. Additionally, specific instruction in procedures, regulations, methods, responsibilities, and personnel interfacing, as applicable, was provided to Promatec personnel. The staff reviewed records to verify attendance at this training.

Conversely, the licensee's review also determined that Promatec QC personnel were well trained and knowledgeable. The staff established, from a review of the Promotec procedures, that QC hold points were required to be implemented. The staff determined that the licensee verified that QC hold point inspections had been performed as specified in the seal installation process. Therefore,

assurance is provided that previously installed penetration seals are satisfactory.

d. Staff Position

The staff finds that the concerns identified above have been responsibly dispositioned by the licensee.

e. Action Required

No further action is required.

No violations or deviations were identified.

11. Open Item Followup

a. Vendor Problems Tracking System (Open Item 84-03-01, Closed)

The licensee has instituted a new commitment control module as part of the plant information management system that is used to track vendor problem reports. Additionally, responsibilities have been defined for Westinghouse Technical Bulletins, NRC Bulletins and Notices, Nuclear Operations Maintenance Information Service information, and INPO's Significant Operating Experience Reports and information service. This item is closed.

No violations or deviations were identified.

12. Licensee Event Report (LER) Follow-up (Unit 1)

Circumstances and corrective actions described in the following LERs were examined. Review of the LERs, and reporting to NRC within required time intervals by the licensee, was verified by the inspectors. The inspectors also ensured appropriate corrective actions were established and applicable events were accurately described. Accordingly, the following LERs are considered closed:

LER 85-04: Nonfunctional fire barriers were acceptably reported and addressed by the licensee.

LER 85-03;
LER 85-06;
LER 85-07;
LER 85-09: These four LERs were discussed in Inspection Report Number 50-275/85-01 and were verified to have been acceptably reported by the licensee.

LER 85-11: The manual reactor trip on loss of feedwater is discussed within this report; it was also acceptably addressed and reported by the licensee.

No violations or deviations were identified.

13. Exit Interview

On March 29 and April 5, 1985, exit meetings were conducted with the licensee's representatives identified in paragraph 1. The inspectors summarized the scope and findings of the inspection as described in this report.

Increased awareness of Unit 2 activities by operations and responsible plant personnel, commensurate with that of Unit 1, was identified by inspection activities as a subject of concern which warrants additional attention by plant management. The particular circumstances referenced below, which support the inspector's concern, were emphasized at the exit meeting of April 5:

- Man-on-line tags for DG 2-2 missing in control room (see section 4.c of this report.
- 125 VAC vital distribution panel supplied from an interruptible source (see section 5.3 of this report).
- Over-flow of CCW surge tank to auxiliary building sump (see section 3.d).