

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/84-03 and 50-323/84-03

Docket Nos. 50-275 and 50-323 License Nos. DPR-76 and CPPR-69

Licensee: Pacific Gas and Electric Company  
77 Beale Street, Room 1435  
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 5 through March 24, 1984

Inspectors: H. L. Canter for 4-27-84  
M. L. Padovan, Resident Inspector Date Signed

H. L. Canter for 4-27-84  
M. M. Mendonca, Senior Resident Inspector Date Signed

Approved by: H. L. Canter 4-27-84  
H. L. Canter, Chief, Reactor Projects Date Signed  
Section 3

SUMMARY:

Inspection during February 5 through March 24, 1984 (Report No. 50-275/84-03, 50-323/84-03)

Areas Inspected: Routine inspection of plant operations; maintenance; surveillance; startup testing; allegation follow-up; open-item follow-up, quality assurance, and independent inspection. This inspection effort, by two resident inspectors, required 177 inspection-hours on Unit 1 and 13 inspection-hours on Unit 2.

Results: One item of noncompliance was identified in the area of access control to stored Class 1 materials.

## DETAILS

### 1. Persons Contacted

- \*R. C. Thornberry, Plant Manager
- \*R. Patterson, Plant Superintendent
- \*J. M. Gisclon, Power Plant Engineer
- \*D. B. Miklush, Supervisor of Maintenance
- \*J. A. Sexton, Supervisor of Operations
- \*J. V. Boots, Supervisor of Chemistry and Radiation Protection
- W. R. Ryan, Mechanical Maintenance General Foreman
- \*R. G. Todaro, Security Supervisor
- \*G. M. Seward, Acting Supervisor of Quality Assurance
- \*R. M. Lockett, Regulatory Compliance Engineer

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

\*Denotes those attending the exit interview on March 23, 1984.

### 2. Operational Safety Verification

- a. 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 limiting conditions for operation as prescribed in the facility Technical Specifications. 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 on 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) Ignition sources and flammable material control.
- (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.

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. Loss of Containment Integrity

On February 24, 1984, both the inner and outer containment personnel access hatches were inadvertently opened at the same time. This incident occurred because the mechanical interlock on the hatches failed. Normally, the interlock would prevent both hatches from being opened simultaneously. The cause of the interlock failure was attributed to improper operation of the hatch hand wheel (see the Maintenance section of this report). As a result of this incident, containment integrity was lost for a period of about three minutes.

The ACTION statements of Technical Specification 3.6.1.1 require that containment integrity be restored within one hour of loss of integrity. Accordingly, the ACTION requirements of the Technical Specifications were met in a timely manner.

Corrective actions to prevent recurrence of this incident included 1) placing additional operating instructions on the personnel air lock and 2) continuously stationing trained hatch operators at the personnel air lock hatches during the current periods of heavy traffic in and out of containment.

During this event, a relatively large pressure differential (2 to 3 psid) existed between the inside and the outside of containment. This resulted in an air flow into containment which blew a folding chair into containment, caused 2 or 3 worker in the airlock to stumble into containment, and affected several other workers in the area. There were no personnel injuries or equipment damage associated with this event.

Prior to this event, on two occasions, several workers could not egress from the air lock without help. This problem was due to improper operation of the containment airlock doors. The containment air lock inner door operating mechanism was not fully closed, as indicated by warning lights. Without the operating mechanism fully closed, the mechanical interlock would not allow outer door operation. Personnel in the airlock contacted an operator who instructed them on this fact. Correct door closure was then achieved, so that personnel could leave the airlock area.

No items of noncompliance or deviations were identified.

3. Open Item Followup (50-275/83-19-05 Closed)

Item 83-19-05 was opened to verify that the licensee reviewed, and revised, as required, all of the Unit 1 Plant Normal Operating Procedures, prior to the use of the procedures. This commitment was completed, as documented by PG&E memorandum dated February 19, 1984 from J. A. Sexton, Operations Manager. This item is CLOSED.

No items of noncompliance or deviations were identified.

4. Snubber Bolt Failures

During the January 1984 disassembly of the Unit 2 Steam Generator 100 KSI snubbers, licensee contractors determined that one bolt had failed and three had crack indications. These bolts join two sections of the hydraulic snubbers casing, and total about 40 bolts per snubber. The licensee's Material and Quality Services has determined that the bolt failures were caused by hydrogen intrusion from the manufacturing process. The phenomenon is such that the bolts crack almost immediately after forging, rather than the cracking being attributed to inservice conditions experienced while the bolt is installed in the snubber. This topic was a Part 21 notification in about 1976. At that time, the licensee had examined a large number of bolts and had replaced all cracked bolts.

The Project Team Engineering group analyzed the required bolting configurations to determine if the snubber was functional with the cracked bolts. This analysis showed that only seven bolts, evenly distributed about the casing, are required for proper snubber operation. Additionally, more than seven bolts in direct succession must fail in order to affect snubber function. All the Unit 2 snubber bolts (about 640) were inspected, and were found to be acceptable.

Nuclear Plant Operations performed UT examination on 3 out of 4 Unit 1 Steam Generator 100 KSI snubbers in response to the potential nonconformance without finding failures.

In reviewing the process to establish the licensee's engineering response to the problem, the inspectors concluded that the licensee's engineering, construction, and operations organizations generally responded acceptably, that is, followed written procedures in a timely manner. The Engineering Department does have a procedure numbered 9.1 that specifies the methods of dealing with nonconformances. This procedure specifies that the Engineering Department has responsibility for organizing and chairing Technical Review Groups to evaluate potential engineering nonconformances. In this case, Engineering deferred this responsibility to Nuclear Plant Operations and General Construction (GC). This minor point was raised with Engineering personnel who indicated that this problem had been recognized from quality assurance program audits and this is being addressed. This was verified with the onsite QA manager. Revisions of related QA procedures are in progress.

No items of noncompliance or deviations were identified.

## 5. Maintenance

### a. 4 KV Breakers

In the fall of 1983, a 4 KV General Electric (GE) Magne-Blast breaker experienced a failure to close. As a result of an evaluation of the failure, the licensee established a program to overhaul all Magne-Blast breakers at the Diablo Canyon facility. Several bushings in the operating mechanism of each breaker were replaced. These bushings are made from a teflon-coated fiberglass material (trade name Tuf-Loc), which has exhibited abnormal wear with breaker actuations (opening and closing). The inspectors observed the breaker overhaul activities, which were conducted in accordance with shopwork followers, vendor manuals and written procedures. These activities were performed in an acceptably controlled and clean environment.

As a result of recent breaker closing failure experienced during the last several months, which were associated with the bushing wear problem, the inspectors examined the licensee's schedule for breaker overhauls. The licensee has completed all vital KV 4 breaker overhauls. The licensee stated that they have overhauled all 4 KV breakers (1) which must close to provide safety functions and 2) have experienced more than 200 cycles of operation. Since breaker failures have been observed by the licensee to occur at approximately 500 to 900 cycles, the licensee's commitment is considered acceptable.

Additional breaker problems, identified by the licensee during the breaker overhauls, were discussed with the licensee. These additional problems (tolerances, bent shafts, welds cracks, etc.) and the original bushing problem, were documented in an internal NRC memorandum and are being evaluated for generic implications. Also, the licensee plans to use their problem reporting system to evaluate the generic aspects of the identified breaker problems. It remains to inspect the licensee's vendor information tracking and resolution system (Open Item 84-03-01).

No items of noncompliance or deviations were identified.

### b. Reactor Coolant Pump (RCP) Motor Replacement

On February 23, 1984 the licensee discovered debris in the air cooling vents of the RCP 1-3 motor. The licensee inspected the motor, and found that insulation on the motor windings had been damaged. The metal and paper debris had been picked up by the motor air cooling vanes and thrust against the windings, removing insulation from the windings.

The motor from the Unit 2 RCP 2-3 was removed and serviced for re-installation on RCP 1-3. While servicing RCP 2-3, debris (two soda cans, a pair of gloves, a plastic butane lighter, and a banana peel) were removed from the air cooling vents. The inspector observed the removal and re-installation of the motor on the Unit 1 RCP. Shop work follower (SWF) MM-1-84-197 was used by the licensee to coordinate the various procedures and to provide additional instructions.

During installation of the Unit 2 motor on RCP 1-3, difficulties were encountered in mating the Unit 1 upper bearing oil cooler to the motor housing. With the Unit 1 oil cooler mounted to the Unit 2 RCP motor, the cooling water piping connections did not align properly. Accordingly, the Unit 1 oil cooler was removed, and replaced with the Unit 2 cooler (originally mated with the Unit 2 RCP motor). However, the cooling water piping connections still did not mate to the oil cooler. Subsequently, the cooling water piping was modified to provide correct alignment to the oil cooler.

The inspector noticed that proper metal blind flanges were placed on open cooling water pipe flanges. However, the flanges on the bearing coolers and metal braided bearing oil hoses were covered only with plastic bags. On several cases, the bags were not secured to the flanges. Electrical tape was also used to close off ends of a hydraulic coupling. The inspector discussed with the mechanical maintenance General Foreman the need for proper sealing of open systems for cleanliness purposes. The General Foreman was in agreement with the inspector's observation.

No items of noncompliance or deviations were identified.

c. Snubber Capscrews

In response to an NPO Quality Control audit, General Construction personnel examined PSA snubbers for unacceptable cap screw thread engagement. The licensee identified the cause of the unacceptable thread engagement to be the use of Anchor Darling rear brackets (extension tubes) with PSA provided capscrews. Of the 45 snubbers with this combination of Anchor Darling and PSA hardware, six had unacceptable cap screw thread engagement. The licensee plans to review all hardware combinations to assure that no similar cap screw thread engagement problems exist. Additionally, the licensee is analyzing the operability of the six snubbers which had unacceptable thread engagement to determine reportability to the NRC.

No items of noncompliance or deviations were identified.

d. Containment Personnel Hatch Interlock

An inspector observed corrective maintenance activities on the containment personnel hatch mechanical interlock. The mechanical interlock was damaged when an individual forcibly turned a hatch handwheel to open the inner hatch, even though the indication lights on the hatch showed that the door should not be opened (the outer hatch was already open).

The mechanical interlock consists of two cylindrical interlocking plates which are attached to shafts from the locking mechanism of each hatch in the penetration. The interlocking plates are positioned to assure that only one hatch can be opened at a time. The cylindrical plates are attached to a mounting bracket by three small screws. These screws were sheared off when the individual forced the inner hatch handwheel to the open position.

Public concerns about the age of the hatches were raised. The licensee reviewed their hatch maintenance records, and found that no significant maintenance problems, related to age of the hatches, exists. This finding is consistent with the inspector's observations. Additionally, the hatches have recently passed surveillance testing requirements for containment integrity. Accordingly, the inspector concludes that the personnel airlock is being maintained acceptably.

The inspector observed portions of the replacement of the mechanical interlock, which was accomplished using components removed from Unit 2. This replacement work was conducted in accordance with a written shopwork follower.

No items of noncompliance or deviations were identified.

e. Steam Generator Snubbers

As previously discussed in NPC Inspection Report 50-275/83-41, the snubber manufacturer has recommended that the seals on the steam generator snubbers be replaced after every five years of inservice use. The existing seals are about twelve years old. Accordingly, the inspector requested the licensee to address this issue.

The licensee's response is to qualify the existing seal material and snubber service life. At the first refueling outage, the snubbers will then be replaced with Unit 2 snubbers, which have already been rebuilt with a long life seal material. In qualifying the snubbers, two of the sixteen Unit II snubbers were tested by the manufacturer in the as-found condition. The testing consisted of a full load functional test and a friction (drag) force test. All test acceptance criteria were met, and no leakage occurred. The snubbers were then disassembled and inspected for any signs of degradation. The internal surfaces were found to be in excellent shape, including

piston, rod, bronze bearings, and cylinder. The original seals were found to also be in excellent condition, with little or no signs of compression set or chemical decomposition and the surfaces were clean. Fluid samples were taken from both snubbers and tested for particle amount and chemical composition. The fluid samples were analyzed and found to be acceptable.

The licensee's conclusion resulting from this testing is that the original seal material has not begun deteriorating since original manufacturing and assembly. This was expected due to the fact that temperature and radiation are the primary cause of degradation, and none of the Diablo Canyon snubbers have seen any appreciable amount of temperature or radiation. The licensee therefore concluded that the 5 year service life begins when the plant is in commercial operation. While the above testing was performed on only two snubbers (a limited sample), the data obtained supports the licensee's conclusions. Accordingly, this item is considered closed.

No items of noncompliance or deviations were identified.

## 6. Surveillance

### a. Diesel Generators

Portions of Surveillance Test Procedure (STP) M-15, "Integrated Test of Engineered Safeguards and Diesel Generators," were observed by an inspector. This STP requires verification that 1) on a Safety Injection (SI) signal, without loss of offsite power, startup power energizes the vital buses and sequences emergency loads onto the bus, and that 2) on a SI signal, with loss of offsite power, the vital buses are deenergized, electrical load is shed from the vital buses, the diesel generators start, energize the vital buses, and the loads are sequenced and maintained. An inspector observed a portion of the test for SI with loss of offsite power. The acceptance criteria were met.

No items of noncompliance or deviations were identified.

### b. Containment Purge Exhaust Valves

Additional administrative controls were found to be necessary to assure that leak rate testing of the containment purge exhaust valves is performed within the time limits specified in the plant's Technical Specifications (TS). Surveillance Requirement (SR 4.6.3.4) requires that the containment ventilation isolation valves be demonstrated OPERABLE within 24 hours after each closing of each of the valves (operability is determined by leak rate measurement). If the valves are being used for "multiple cycling," then SR 4.6.3.4 specifies that the valves are to be demonstrated OPERABLE at least once every 72 hours.



As a result of a containment purge exhaust valve (RCV-11, located inside containment) failing isolation time surveillance tests, RCV-11 had previously been declared inoperable, and had been isolated. The ACTION statements of TS 3.6.3 were being met since the OPERABLE purge exhaust valve on the containment penetration (RCV-12, located outside containment) was already isolated, and electrical power was removed from the valve operator. However, the Shift Foreman and the responsible engineer did not realize that RCV-11 would normally be subject to the 24 hour leak rate surveillance requirement of SR 4.6.3.4, since it would not be subjected to multiple cycling. The Shift Foreman had incorrectly assumed that this valve would be cycled with other containment ventilation valves, and the leak rate measurement could be performed with 72 hours. Eventually, the leak rate test was performed successfully, 70 hours after closure of the valve.

No actual safety concern resulted from this situation, as TS 4.0.3 specifies that surveillance testing does not need to be performed on inoperable equipment. However, the failure of the Shift Foreman to recognize that a 24 hour valve testing requirement exists is of concern to the NRC.

Accordingly, the licensee has instituted corrective actions which include training of the Shift Foreman and plant engineering personnel. The purpose of the training is to assure that plant personnel will assume that leak rate testing is to be performed within 24 hours after closing of the ventilation isolation valves, unless the valves are cycled. Surveillance Test Procedure VI6A already identifies the 24 hour requirement. Additionally, plant engineering is to keep a separate log to track containment ventilation isolation valve cycling.

No items of noncompliance or deviations were identified.

## 7. Quality Assurance

### Storage of Class 1 Materials (50-323/84-02-01, Open)

In NRC Inspection Report 84-02, inadequacies in the licensee's access control to Class 1 material storage areas were identified. During a follow-up inspection, the inspector examined material storage areas which were located next to 1) the Pullman Shipping and Receiving Warehouse and 2) the "Area 11" Class 1 material storage trailers at Patton Flats. While evaluating the storage areas near the Pullman warehouse, the inspector observed non-warehouse personnel 1) entering the warehouse through open roll-up doors (not a normal controlled entrance), 2) gain access to Class 1 material storage areas, and (3) freely roam throughout the warehouse. In a similar manner, the inspector entered the warehouse through the roll-up doors, and freely walked through Class 1 material storage areas. In discussions with various individuals in the warehouse, the inspector determined that non-warehouse personnel frequently entered the Class 1 material storage areas at will.

In examining material storage areas located at Patton Flats, the inspector observed that doors on the "Area 11" Class 1 material storage trailers were open and unattended. The inspector entered the trailers, walked freely through the trailers, and observed that no warehouse personnel were present. Class 1 material stored in these trailers includes hangers, supports, and mechanical and hydraulic snubbers.

NPAP D-501, "Identification and Storage of Environmentally Qualified and Safety Related Material in Materials Facility" requires safety-related materials to be stored in storage areas which are segregated to the extent that access to them can be limited to specific personnel. NPAP D.501 also requires access to these areas to be controlled by the Materials Department personnel.

ANSI N45.2.2-1972, Section 6.2.1 "Access to Storage Areas" specifies that "Access to storage areas shall be controlled and limited only to personnel designated by the responsible organization." As the licensee has committed to this ANSI Standard in their Quality Assurance Program, and as this standard, a procedure and 10 CFR 50, Appendix B, Criterion XIII (Handling, Storage, and Shipping) were apparently not followed the above conditions represent an item of noncompliance.  
(50-323/84-03-02)

One item of noncompliance and no deviations were identified.

#### 8. Allegation Followup

Allegation RV-84-A-0033 asserted that two unauthorized individuals had gained access to the Unit 1 protected area. The allegor, who was one of the individuals purported to have gained access to the protected area, was contacted by the inspectors and was invited for an escorted onsite visit to reenact the allegor's claimed entry into the protected area. The path of travel of the two individuals was recreated for the inspectors. As a result of this walkthrough, the inspectors established that the allegors did not gain access to the protected area. This closes this allegation.

No items of noncompliance or deviations were identified.

#### 9. Independent Inspection

##### a. Containment Ventillation Systems

The containment ventilation system was placed in an operational configuration which was not clearly addressed by the Technical Specifications (TS). This configuration consisted of the containment purge supply line being opened at the same time the containment pressure relief line was open. TS 3.6.1.7 specifies that "one purge supply line and/or one purge exhaust line of the containment purge system may be open or the vacuum/pressure relief line may be open...." The TS action statements and bases provided further confusion as to which lines could be opened simultaneously. As the NRC's "Safety Evaluation of the Diablo Canyon Nuclear Power

Station" did not provide adequate clarification, the inspector contacted the Containment Systems Branch of NRR. The NRR technical reviewer was asked to specify the permissible purge line configurations. His response was that the operational configuration of the plant's containment ventilation system was acceptable. This interpretation was based upon previous 1) reviews performed by NRR, and 2) qualification of the isolation valves in these lines. This information was transmitted to the licensee's Plant Superintendent. Additionally, the licensee has asked NRR for formal clarification of the TS.

No items of noncompliance or deviations were identified.

b. Containment Isolation Valve Seat Leakage

A containment isolation valve on the steam generator 1-1 blowdown line (located outside containment) was found to be leaking across its seat. The licensee's Inservice Testing (IST) program does not require leak testing of this valve. The inspector contacted the Mechanical Engineering Branch of NRR, and verified that the valve was indeed properly classified in the IST program. Accordingly, the valve is considered OPERABLE, even with leakage across its seat.

For valves subject to leak rate testing, the inspector asked the licensee if the operators had instructions to 1) declare the valves inoperable if the valves fail leak rate tests, and 2) follow the TS ACTION statements for inoperable containment isolation valves. In response to the inspector's question, the licensee's operations manager prepared a memorandum to the Shift Foreman to address the problem.

c. Management Meeting

The onsite General Construction (GC) group is undergoing organizational and personnel changes. Mr. Richard Etzler, the previous Field Construction and Startup Manager, has been promoted to a General Office position not directly related to Diablo Canyon. His replacement is Mr. Robert Lieber. The GC organizational change can be characterized as a change from a matrix organization to the previous PG&E discipline oriented organization, with mechanical, civil and electrical supervisors. Discussions were held with Mr. Lieber on the subjects of organizational changes and changes to the GC Quality Control management.

As a result of manpower needs, GC's Lead Quality Control Engineer (Mr. Kirk Glenn) has been relocated to PG&E's Helms facility. Mr. Ronald Hobgood has assumed the Lead Quality Control Engineer duties.

A meeting was held with Mr. Lieber and Mr. Hobgood to discuss PG&E's Quality Hotline. The meeting focused upon the licensee's progress

in staffing the Hotline, and in resolving concerns which are brought to the Hotline. The inspectors stressed the point that the Quality Hotline must engender the feeling among licensee and contractor personnel that problems reported to the Hotline will be effectively and quickly resolved, without retaliation. Mr. Lieber and Mr. Hobgood acknowledged this need, and are planning to appropriately staff and organize this group to achieve these end results. Mr. John Martin, the Region V Regional Administrator, also discussed this topic with Mr. George Maneatis of FG&E.

No items of noncompliance or deviations were identified.

10. Exit Meeting

On March 23, 1984, an exit meeting was conducted with the licensee representatives identified in paragraph 1. The inspectors summarized the scope of the inspection and findings as described in this report.