U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos: 50-275/86-04 and 50-323/86-05

Docket Nos: 50-275 and 50-323

License Nos: DPR-80 and DPR-82

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: January 26, 1986 through March 1, 1986

Inspectors: R T Dodds for 3/10/86
M. L. Padovan, Resident Inspector Date Signed

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Approved by: R T Dodds 3/10/86
R. T. Dodds, Chief, Reactor Projects Section 1 Date Signed

Summary:

Inspection from January 26, 1986 through March 1, 1986 (Report Nos. 50-275/86-04 and 50-323/86-05)

Areas Inspected: The inspection included routine inspections of plant operations, maintenance and surveillance activities, independent inspection, and follow-up of on-site events. Additionally, inspection of the Unit 2 power ascension startup program continued. Inspection Procedures 71707, 30703, 71710, 62703, 61726, 93702, 61700, 41701, 30702, 37700, 72616, 61711, 50095, 73755 and 92700 were applied during this inspection.

This inspection effort required 127 inspector-hours for Unit 1, and 216 inspector-hours for Unit 2 by three resident inspectors. This inspection began during an off-shift period; approximately 16 hours on Unit 1 and 21 hours on Unit 2 were accomplished during off-shift periods.

Results of Inspection: One violation and no deviations were identified. The violation involved failure to perform required surveillance of containment integrity (paragraph 2.b).

DETAILS

1. Persons Contacted

J. D. Shiffer, Vice President Nuclear Power Generation
*R. C. Thornberry, Plant Manager
*R. Patterson, Assistant Plant Manager, Plant Superintendent
J. M. Gisclon, Assistant Plant Manager for Technical Services
*C. L. Eldridge, Quality Control Manager
*K. C. Doss, On-site Safety Review Group
*R. G. Todaro, Security Supervisor
*S. D. Townsend, Assistant Plant Superintendent
*D. B. Miklush, Maintenance Manager
*J. A. Sexton, Operations Manager
T. J. Martin, Training Manager
W. G. Crockett, Instrumentation and Control Maintenance Manager
*J. V. Boots, Chemistry and Radiation Protection Manager
*L. F. Womack, Engineering Manager
*T. L. Grebel, Regulatory Compliance Supervisor
*S. R. Fridley, Senior Operations Supervisor
R. S. Weinberg, News Service Representative

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/startup personnel.

*Denotes those attending the exit interview.

Note: Acronyms are used throughout this report; refer to the Index of Acronyms at the back of the report.

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 LCOs as prescribed in the facility TS. Logs, instrumentation, recorder traces, and other operational records were examined to obtain information on plant conditions. Trends were examined for compliance with regulatory requirements. 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:

(a) General plant and equipment conditions.

(b) Surveillance and maintenance activities.

(c) Fire hazards and fire fighting equipment.

(d) Radiation protection controls.

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

(f) Interiors of electrical and control panels.

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

(h) Plant housekeeping and cleanliness.

(i) Essential safety feature equipment alignment and conditions.

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. Containment Penetration Piping and Valves

During routine walkdowns of Unit 1 and 2 containment piping penetrations and valving, the inspectors discerned several discrepancies between the as-built configurations and the FSAR descriptions (i.e. Table 6.2-39 and Figures 6.2-19). The more significant of these as-built discrepancies with the FSAR included: a) an un-identified Unit 2 instrument test line installed through Penetration 82; b) an un-identified spare installed through Penetration 76; c) a class I air system through Penetration 80 that was never installed; and d) an un-identified instrument line installed through Penetration 80 (i.e. three lines installed vice the two described by the FSAR). All inspection findings were discussed at length with NPO Engineering and briefly with Regulatory Compliance.

Subsequent cursory walkdowns of units 1 and 2 penetrations by engineering personnel verified the aforementioned findings. Futhermore, engineering department reviews of plant containment integrity surveillance procedures revealed that item a) was not addressed. In other words, there was no evidence that the instrument line thru penetration 82 of unit 2 has ever been monitored in accordance with TS requirements of 4.6.1.1 or TS 4.9.4 during initial fuel load. However, this line was observed to indeed be capped (not sealed) by both the licensee and inspector during their respective walkdowns. Failure to adequately verify that the instrument line through penetration 82 was capped and sealed on a monthly basis, while in modes 1-4, appears to be a violation of TS 4.6.1.1. (50-323/86-05-01).

A TRG was held by engineering, and attended by the inspector, to resolve identified TS and FSAR discrepancies, and propose corrective actions. Some of these actions included: a) revising STP V-6 and I-1D; b) detailed walkdowns of all containment penetrations to verify actual configurations; c) update applicable FSAR line drawings and tables, OVIDs, and P&IDs; d) report to the NRC non-compliance with TS; and e) establish a more agreessive engineering policy of system walkdowns and/or dry-runs during the procedure review process. Implementation of licensee resolutions and corrective actions will be followed-up during the future inspection program.

c. Accumulator 2-2 Weld Leak

During a physical walkdown of the Unit 2 ESF accumulators, an NRC inspector identified leakage from a socket weld joint on the sample and level indicating line to the 2-2 accumulator. This condition was immediately brought to the attention of the maintenance department manager; whereupon, weld examination and repair activities were conducted as part of the Unit 2 strainer outage (see inspection report item 4 b.).

Preliminary evaluation by maintenance engineering has determined this leak was the result of a small crack in the nozzle material, and was very similar in nature to linear indications discovered during the previous startup outage in the 2-1 and 2-3 accumulators fill line socket connection. The potentially generic issue of inadequate accumulator socket weld material fitup, and/or welding has been formally addressed by several TRGs and followed-up by the inspectors.

Engineering safety evaluations of previously identified and repaired coupling leaks on accumulators 2-1 and 2-3 fill lines (see IR 50-323/85-32) had concluded there was no safety significance (i.e., these defects would not have precluded delivery of accumulator inventory to the RCS). Furthermore, these safety evaluations were submitted to Westinghouse, by PG&E, requesting an evaluation under 10 CFR 21. Westinghouse replied that these defects were isolated cases not reportable under Part 21. Since this written exchange, leakage from a crack in the sample line coupling on accumulator 2-2 was discovered. In light of this past history, the licensee's most recent TRG has proposed several resolutions: a) request an OPEG engineering safety evaluation concerning accumulator 2-2, b) an accelerated visual inspection program of Unit 1 and 2 accumulators, c) issue a DCR for a nozzle replacement design, and d) notify Westinghouse of the recent accumulator 2-2 circumstances for their evaluation. NPO Maintenance Engineering, has taken the lead in pursuing future corrective action. The inspectors will continue to follow-up the licensee's investigation and corrective actions concerning accumulator coupling defects.

d. Observations of Axial Flux Control

During re-start and power ascension of Unit 2, AFD was observed to be outside its 5% target band. Operators were aware of this condition from the effects of xenon and continued to closely monitor and log AFD. However operators also noted that the P250 computer was not accurately accounting for accumulated penalty minutes and the AFD monitor alarm did not appear to be functional. Due to these observations, further power escalation was dutifully stalled at approximately 48% as operators conservatively accounted for any cumulative AFD penalty minutes in accordance with TS. The inspector plans to follow-up the upcoming TRG investigation into the identified P250 failure to monitor AFD.

No violations or deviations were identified.

3. Routine Inspection

a. Licensed Operator Training

The inspector reviewed the licensed operator training program for the Unit 1 and Unit 2 facilities. Recent operational events at each unit were evaluated to determine if operator training had bearing on the events, and lessons learned from the events were factored into the training program. The evaluation concluded that LERs, NRC and INPO issuances and other important information on operating experiences were being incorporated into requalification lectures.

Training records of six SROs and ROs were reviewed to verify the necessary documentation was in file. For the past three years, the pass rate for initial and requalification exams was found to be good, as shown below:

	Initial		Requalification
		1983	
RO	6/6		10/12
SRO	10/10		31/31
		1984	
RO	7/7		9/9
SRO	27/27		30/30
		1985	
RO	11/11		14/15
SRO	9/31		41/42

Additionally, classroom and simulator training was observed by the inspector to verify adequacy of the technical presentations.

Regarding INPO Accreditation of the licensee's training programs, the inspector verified accreditation is proceeding in accordance

with the originally established schedule. For the first four training programs (non-licensed operator, licensed operator, senior licensed operator and STA), the licensee has responded to INPO recommendations from a November 1985 team inspection, and expects to appear before the INPO accreditation Board at the end of March 1986. At that time, approval of programs 1-4 could be obtained. By mid July 1986, the self evaluation reports for the remaining training programs will have been submitted to INPO for their review.

b. Spent Fuel Pool Reracking

The inspector held discussions with GC personnel regarding work in process on the Unit 1 spent fuel pool in prepartion for expected installation of high density spent fuel racks. The inspector observed that the existing racks have been removed from the dry pool and unneeded anchor bolts are being eliminated by grinding. Existing shims which interfere with the new racks are being ground out from the fuel pool floor and are being tack-welded to their respective places on the bottom of the existing racks. Light brackets and the spent fuel handling tool holder will also be relocated. Upon completion of this preparatory work, the existing racks will be re-inserted into the pool. At this time, delivery of the new high density racks is scheduled for mid March 1986.

No violations or deviations were identified.

4. Maintenance

The inspectors observed portions of, and reviewed records on, selected maintenance activities to assure compliance with approved procedures, technical specifications, and appropriate industry codes and standards. Furthermore, the inspectors verified maintenance activities were performed by qualified personnel, in accordance with fire protection and housekeeping controls, and replacement parts were appropriately certified.

a. Reactor Vessel Head Vent Valves

The inspector observed the corrective maintenance performed on the subject valves. The fluid system was properly cleared and qualified electricians performed the maintenance on the valve position reed switches. All steps of the shop work follower EM-2-86-034 were performed and the work summary section completed when the work was finished. Additionally, the inspector verified the sealed valve change sheet properly documented the sealing open of RCS-2-604 after the fluid system clearance was completed and the valve line up was repositioned and independently verified.

b. Accumulators 2-2 Sample Line Coupling Repair

The coupling for the sample and level indicating line on the 2-2 accumulator was repaired during the Unit 2 strainer outage. An inspector witnessed selected portions of the maintenance, QC and ISI activities associated with this socket weld examination and nozzle

material repair work. All applicable documents (i.e. SWF, SWP, clearance, ASME Section XI work traveler, weld and open flame permit, and maintenance procedures) were reviewed during and following completion of this evolution by the inspector. Additionally, specific clearance points were walked down and the post maintenance operational pressure leak test was verified as an accomplished.

c. Component Cooling Water Heat Exchanger 2-2

The inspector observed some cleaning activities by maintenance personnel to remove biological fouling from the ASW side tubes of the 2-2 CCW Hx. Clearance controls were reviewed and specific points were independently verified. Hx opening, closing, and cleanup maintenance work and QC involvement observed by the inspector were consistent with applicable SWF instructions and plant procedures.

d. Unit 2 Letdown Orifice Isolation Valve

During Unit 2 strainer outage a local leak rate test of inside containment isolation valves FCV-8149 A, B, and C (letdown orifice isolations) revealed excessive seat leakage. Subsequent investigation determined FCV-8149B had valve seat corrosion and alignment problems which resulted in leakage exceeding local leakrate acceptance criteria for this penetration. The inspector monitored the investigation process by engineering and maintenance personnel and observed subsequent valve repair. During repair activities, maintenance and radiological controls were reviewed and appeared to be appropriately implemented. Following restoration of 8149 B, the inspector witnessed applicable post maintenance local leakrate testing and reviewed the completed SWF. FCV 8149 A, B, and C were determined to comply with the plants administrative acceptance criteria for individual containment isolation valve leakage.

No violations or deviations were identified.

5. Surveillance

By direct observation and record review of selected surveillance testing, the inspectors assured compliance with TS requirements and plant procedures. The inspectors verified that test equipment was calibrated, and acceptance criteria were met or appropriately dispositioned.

a. Unit 1 Containment Pressure Transmitter

Containment pressure channel 935 for Unit 1 was declared inoperable when an I&C internal audit discovered its TS required 18 month surveillance frequency had been exceeded. An inspector verified channel 935 was properly removed from service in compliance with TS, appropriately documented step-by-step on the STP summary data sheet, and accurately entered in to the operations TS action status system.

Calibration of containment pressure transmitter 935 was performed in accordance with STP I-15B3 and witnessed by an inspector. The "as found" data was accurately recorded and observed to exceed desired accuracy. Compensatory adjustments were made by qualified I&C technicians in containment, and subsequent "as left" data was considered satisfactory. Test equipment hookup and calibration was also verified by the inspector.

b. Unit 2 Rod Drop Time Testing

Individual full-length shutdown and control rod drop times are required to be measured at least every 18 months by TS 4.1.3.4.c. Measurement of Unit 2 rod drop times, from the fully withdrawn position, with the plant in Hot Standby (mode 3) condition was accomplished by STP R-1B. An inspector monitored step-by-step performance of STP R-1B by qualified nuclear engineering, operations, I&C, and start-up personnel for shutdown banks A and B. During test operations, the inspector independently verified plant conditions and procedure prerequisites were established, test precautions and limitations were followed, and test equipment hook-ups and disconnects were consistent with procedure instructions. Furthermore, the inspector reviewed data sheets and oscillograph rod drop "time evaluation" traces for shutdown rods in banks A and B. These data sheets were accurately filled out and signed. Rod drop time traces were appropriately marked for identification and promptly evaluated against TS based acceptance criteria.

c. Unit 2 Emergency Boration Flowpath

Operability of the emergency boration flowpath is normally verified by observing at least 20 gpm flow on FI-113 during performance of STP V-3E5. During the Unit 2 strainer outage FI-113 was broken. In order to verify operability of the emergency boration flowpath required by TS 3.1.2.2 for mode 4 transition, STP V-3E5 was revised. The revised test procedure, using VCT level, was reviewed and the test was witnessed by an inspector. This STP was performed by a licensed operator and resultant data evaluated by a senior engineer. VCT level increases during emergency boration were observed by the inspector, and appeared to demonstrate greater than the minimum required flowrate.

d. Unit 1 Operator Heat Balance

Heat balance calculations are required daily by TS 4.3.1 for calibration of NIS power range channels whenever rated thermal power exceeds 15%. An inspector witnessed a performance of STP R-2B "Operator Heat Balance" for Unit 1 at 100% power. This particular heat balance was applying a recently generated FW flow venturi fouling adjustment factor for the first time. STP R-2B had been specifically revised to incorporate this adjustment factor into the heat balance surveillance calculations. As a direct result, NIS power range channels were determined by the SFM, STA and senior nuclear engineer to require approximately 2.5% gain adjustment for all channels.

The inspector observed step-by-step conduct of STP R-2B by operations and nuclear engineering. Additionally, data sheets were independently reviewed during data recording, reduction and calculation (manually and by computer program). The inspector also verified procedure compliance and evaluated the test results. The licensee's review and approved process was scrutinized throughout implementation of STP R-2B. Upon completion of this test, after appropriate authorization, a licensed STA was observed by the inspector to reset the potentionmeter gain of all four NIS power range channels. This adjustment was adequately controlled and independently verified by a senior nuclear engineer. The basis and methodology of further adjustments due to FW flow venturi fouling will be followed up by the inspector in subsequent routine inspections.

No violations or deviations were identified.

6. Independent Inspection

a. Control of Heavy Loads

The licensee's program for the control of heavy loads was reviewed by the inspectors, including administrative procedures C-702, "Handling of Large Equipment" and C-757, "Special Lifting Device Certification Program". These NPAPs are in compliance with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants". Specific lifting instuctions are included in the applicable maintenance procedures. Heavy loads not specificly identified in a maintenance procedure are lifted in accordance with procedures written under the guidelines of NPAPs C-702 and C-757.

b. Feedwater Flow Venturi

The inspector has begun to investigate the FW flow venturi fouling adjustment factor used in revision 4 of STP R-2B "Operator Heat Balance." The inspector will evaluate the 10 CFR 50.59 review and verify the basis used in developing this adjustment factor the next inspection period.

No violations or deviations were identified.

7. Unit 2 Start-up Test Program

At the end of this inspection report period unit 2 was finishing its 100 hour NSSS warranty run at 100% power. Only the Net Load Rejection, RCS Temperature Instrument Alignment, and Reactor Turbine Control tests require further testing prior to completion of the power ascension test program. The inspectors continue to encourage the Start-up organization to conduct their reviews of field complete test procedures in a timely fashion. Inspector evaluations of completed procedures for specific tests, and general power plateau tests, are ongoing. Promptness of Start-up/NPO closeout of test procedures, following completion of the power ascension program, will be monitored as the inspectors attempt to accomplish their evaluations.

8. Licensee Event Report Follow-up

Circumstances and corrective actions described in the LERs listed below were examined by the inspectors. Reporting to the NRC was within the required time interval, but on several occasions LERs were submitted on the 30th day following identification of the events. The inspectors discussed this trend with the licensee to determine if corrective actions were necessary. In order to assist in assuring LERs are reported in a timely fashion, the licensee has recently hired an additional regulatory compliance engineer.

Unit 1: 85-35, 85-36

Unit 2: 85-11, 85-17, 85-18, 85-21, 85-22

The inspectors also ensured corrective actions were established and events were accurately described.

No violations or deviations were identified.

9. Exit

On February 28, 1986 an exit meeting was 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.

Index of Acronyms

AFD	Axial Flux Difference
ASME	American Society of Mechanical Engineers
CCW	Component Cooling Water
CFR	Code of Federal Regulations
DCR	Design Change Request
ESF	Engineered Safety Features
FSAR	Final Safety Analysis Report
FW	Feedwater
GC	General Construction
I&C	Instrumentation and Control
INPO	Institute of Nuclear Power Operations
IR	Inspection Report
ISI	Inservice Inspection
LER	Licensee Event Report
LCO	Limiting Conditions for Operation
NIS	Nuclear Instrumentation System
NPAP	Nuclear Plant Administrative Procedure
NPO	Nuclear Power Operations
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
OPEG	On-site Plant Engineering Group
OVID	Operating Valve Identification Diagram
P&ID	Piping and Instrumentation Diagram
QC	Quality Control
RCS	Reactor Coolant System
RO	Reactor Operators
SFM	Shift Foreman
SRO	Senior Reactor Operators
STA	Shift Technical Advisor
STP	Surveillance Test Procedure
SWP	Special Work Permit
SWF	Shopwork Follower
TRG	Technical Review Group
TS	Technical Specification
VCT	Volume Control Tank