

U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report Nos: 50-275/88-21 and 50-323/88-19

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: July 17 through September 3, 1988

M. M. Mendonca for 9/26/88
K. E. Johnston, Resident Inspector Date Signed

M. M. Mendonca for 9/26/88
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Approved by: *M. M. Mendonca* 9/26/88
M. M. Mendonca, Chief, Reactor Projects Section 1 Date Signed

Summary:

Inspection from July 17 through September 3, 1988 (Report Nos. 50-275/88-21 and 50-323/88-19)

Areas Inspected: The inspection included routine inspections of plant operations, maintenance and surveillance activities, follow-up of onsite events, open items, and licensee event reports (LERs), as well as selected independent inspection activities. Inspection Procedures 30703, 61726, 62703, 71707, 90712, 92700, 92701, 92702, 93701, 93702, and 94703 were applied during this inspection.

Results of Inspection: No violations or deviations were identified.

Indications of weaknesses in the licensee's quality verification programs have been identified in the enclosed report in the following areas:

- o Although licensee action plans have become more explicit, events described in paragraph 4.a. received little follow-up and independent verification by management and quality control of actions taken.

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- o Paragraph 4.f., describes a lack of initiative in changing inadequate I&C surveillance procedures, on the part of QC and QA. In addition the paragraph describes a lack of confidence of some plant personnel in the Quality Hotline program. The licensee will investigate plant attitude towards the Quality Hotline.
- o Following the reactor trip of July 17, it was noted that QA and QC were not involved in restart reviews. In response to the inspectors comments in this area, the licensee has committed to take action to require QA/QC verification of such action plans.

Other areas of weakness include:

- o A need for increased attention to LER content, as noted in paragraph 9 d.
- o A need for the licensee to promote a sense of ownership and urgency in the resolution of problems that have been identified. Examples of problems lacking timely resolution because responsibilities were diffuse include seismic trip annunciation design changes, the closed anti-motoring relay switch root valve, I&C procedure changes, and containment door modifications scheduled for 1990.
- o Four reactor trips occurred during the reporting period which is a negative trend in this area.

Areas of strength include:

- o Improved depth of action plans,
- o Licensee response to inspector identified problems.
- o An I&C technician avoided a potential reactor trip situation by recognizing a procedural pitfall and stopping work activities to get adequate instructions.



DETAILS

1. Persons Contacted

- J. D. Townsend, Plant Manager
- *D. B. Miklush, Assistant Plant Manager, Maintenance Services
- L. F. Womack, Assistant Plant Manager, Operations Services
- B. W. Giffin, Assistant Plant Manager, Technical Services
- *J. M. Gisclon, Acting Assistant Plant Manager, Support Services
- *C. L. Eldridge, Quality Control Manager
- W. B. McLane, Unit 2 Refueling Outage Manager
- *S. G. Banton, Engineering Manager
- T. A. Bennett, Acting Maintenance Manager
- *D. A. Taggart, Director Quality Support
- W. G. Crockett, Instrumentation and Control Maintenance Manager
- *T. L. Grebel, Regulatory Compliance Supervisor
- *S. R. Fridley, Operations Manager
- M. R. Tresler, Project Engineer
- M. E. Leppke, Onsite Project Engineer

The inspectors interviewed several other licensee employees including shift foreman (SFM), reactor and auxiliary operators, maintenance personnel, plant technicians and engineers, and quality assurance personnel.

*Denotes those attending the exit interview on September 16, 1988.

2. Operational Status of Diablo Canyon Units 1 and 2

a. Operational Status

At the beginning of the reporting period, Unit 1 had just restarted following its second refueling outage. The Unit remained at power except for reactor trips on August 30 and September 1. The first trip was due to a main feedwater pump overspeed trip. The second trip was due to a closed anti-motoring instrumentation root valve associated with the main turbine.

Unit 2 remained at full power except for reactor trips on July 17 and September 1, 1988. The first trip was manually initiated following ground faults resulting from a faulty RCP motor termination. The unit remained shutdown until August 9 to repair a leaking steam generator manway. The second trip occurred during the surveillance of seismic trip instrumentation when a tripped, redundant relay was undetected.

Of general interest, the NRC Maintenance team concluded their inspection on July 22 and NRC Commissioner Rogers toured the site on July 26, 1988.



3. Operational Safety Verification (71707)

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 Operations (LCOs) as prescribed in the facility Technical Specifications (TS). Logs, instrumentation, recorder traces, and other operational records were examined to obtain information on plant conditions, and trends were reviewed 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) Fire hazards and fire fighting equipment.
- (c) Radiation protection controls.
- (d) Conduct of selected activities for compliance with the licensee's administrative controls and approved procedures.
- (e) Interiors of electrical and control panels.
- (f) Implementation of selected portions of the licensee's physical security plan.
- (g) Plant housekeeping and cleanliness.
- (h) Essential safety feature equipment alignment and conditions.
- (i) Storage of pressurized gas bottles.

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. Annunciator Response Procedures Out of Order

During a routine review of annunciators with the control operator, the inspector observed that the Unit 2 controlled copy of annunciator response procedures for the first annunciator panel (PK-01) had been issued out of order. Specifically, the back of a two sided page was five pages out of sequence from the front due to an apparent copying error. This problem affected 19 annunciators.



The shift foreman (SFM) had the complete manual reviewed for similar problems and found no other examples. In addition, the SFM had a new copy of the PK-01 response procedure installed.

The inspector discussed this problem with the plant manager. During normal plant operations, the annunciator response procedures are infrequently referred to by operators. However, during abnormal plant operations the use of these procedures is necessary and procedures out of order could have resulted in confusion, untimely or inappropriate actions. The plant manager concurred and stated that additional review would be performed on critical procedures required for use by operators during abnormal conditions (such as emergency procedures, abnormal procedures, and operating procedures) to assure they are filed correctly. Corrective actions taken will be followed up during normal inspection.

No violations or deviations were identified.

4. Onsite Event Follow-up (93702)

a. Manual Reactor Trip Initiated as a Result of Extensive Ground Faults

On July 17, 1988, Unit 2 experienced a series of ground faults which led to manual load shedding, a manual reactor trip, a safety injection due to high steam line differential pressure, and a natural circulation cooldown. During the event, a number of water hammer events occurred in the plant secondary systems. The details of the event are described in LER 2-88-008.

The licensee launched an Event Investigation Team (EIT), in accordance with their procedures, to examine the causes and corrective actions pursuant to the event. The detailed sequence of events, the licensee's analysis of root cause and corrective actions were addressed by the EIT and will be included in the licensee's LER on the subject event. Therefore these items will not be repeated here.

The inspector independently reviewed and assessed the licensee's analysis and corrective actions for the electrical faults, the water hammers, circuit breaker coordination, operator effectiveness, and pressurizer PORV actuation. In general, the licensee performed a proper response to the event including upper management guidance and support utilizing the EIT methodology developed in 1987.

However, specific NRC concerns determined were:

- o Technical: 230kv startup power, one of the two required offsite sources, is supplied to both units startup (S/U) transformers by a single high side breaker (OCB-212). This common mode failure concern has been committed to be addressed by October 31, 1988, by the licensee (Action Plan Item #36).
- o Management: Senior licensee management (the PG&E President and the Senior Vice President for Nuclear) appeared on the site on



July 17, to set the proper tone for thorough root cause evaluation and action. However, the execution of the investigation with respect to the planning, examination, and saving the evidence to provide comprehensive corrective actions, was not performed in the level of detail to be fully effective. The inspector found that the investigation lacked an adequate overview of its conduct. This detailed review is ordinarily expected to be performed by involved management and further overview conducted by QA/QC. The problems identified by the inspector on July 21, during a Plant Safety Review Committee (PSRC) review of readiness for restart indicated that the overview of the licensee's action plan was not thorough. Specifically, the inspector identified that the licensee had not high potted all affected breakers, had repaired the broken 12kv grounding circuit fuse holders "as required" without providing required weld sizes to the welder, and had not initiated an inspection of other 12kv fuse holders for similar postulated broken welds.

The plant manager on September 1, 1988, in response to the inspectors critique, stated that action would be taken to require QA/QC verification of action plan activities.

b. Unit 2 Spent Fuel Pool Overflow

On July 19, 1988, the Unit 2 spent fuel pool overflowed to the fuel transfer canal due to a valve lineup error and consequent draining a relatively small amount of inventory from the refueling water storage tank to the spent fuel pool. The Assistant Plant Manager for Operations stated that he would determine the root cause and take appropriate actions. This event will be followed up in the normal course of inspection.

c. Unit 2 Steam Generator Leaking Manways

On July 22, 1988, the resident inspector was informed of minor leakage discovered on the Unit 2 steam generator manways. Root cause analysis showed the cause to be the cooldown of the reactor plant to cold shutdown coupled with a relaxation phenomenon of "Superflex" flexatallic gaskets used in the manway closure. Corrective action required the licensee to drain to midloop operations to replace the gaskets and extend the unplanned outage. The licensee presented and the inspectors reviewed a justification for continued operation of Unit 1 which had similar gaskets installed.

On August 9, 1988, Unit 2 achieved criticality following gasket replacement.

d. Commissioner Rogers Visit

On July 26, 1988, NRC Commissioner Kenneth Rogers visited the Diablo Canyon site, toured the facility, met with plant management, and conducted a press interview. The Commissioner advised management to



maintain a rising standard of excellence and to effect improvements in a timely way in order to maintain pace with the industry.

e. Inadvertant Dilution of the BAST and BIT

On July 28, 1988, the licensee discovered that the Boric Acid Storage Tank (BAST) and the Boron Injection Tank (BIT) had been diluted to 20,486 ppm boron (vs 21,000 ppm minimum) due to leaking pure water valves. The condition was restored to appropriate values within technical specification action time requirements. The licensee operations management stated that they intended to pursue a lasting plant design change, such as additional isolation valves with a vent or blankable piping, to prevent recurrence since this dilution had occurred previously.

Since the licensee is pursuing a technical specification change to eliminate the high concentration of boron in the BIT there appears to be little technical significance to this event.

f. Backlog of I&C Procedure Changes

On July 28, 1988, the inspector met with plant management regarding a backlog of important procedure changes, in I&C, which had been submitted by I&C technicians but not acted upon for a long period of time. This situation came to the inspectors attention after a near miss reactor trip on July 20, 1988, when an I&C technician avoided causing a reactor trip by recognizing a pitfall in the procedure. Subsequent discussion with I&C technicians led to the discovery that a suggested procedure change to avoid the pitfall had been recommended on April 2, 1987. Similarly, a containment ventilation isolation had in fact occurred on March 5, 1988, in Unit 2 caused by wiring problems which had been identified on October 22, 1987.

Several additional problems were revealed as a result of the discussion with plant management. The more significant problems were:

- o There was no plant procedure that adequately described how to submit, prioritize and track procedure change requests. Likewise, there was no feedback mechanism to suggesters.
- o Suggested changes to quality related procedures were not reviewed by QC.
- o There were about 200 outstanding actions dealing with I&C procedure changes.
- o The licensee's investigative actions after the March 5, 1988, CVI did not reveal that the problem had been previously identified and not acted upon.

The inspector discussed with plant management specific opportunities for the quality organizations to address this problem. First, the QA organization in conducting quality enhancement seminars with



craft in late 1987, had been appraised of the potential procedure problems in writing on August 14, 1987. The problem was not surfaced at the time because the QA personnel did not understand the significance of the procedure problem, acted more as a clearing house, and closed the "issue" on a commitment by I&C Engineering for resolution rather than performing an evaluation of the problem and the adequacy of the I&C response. Finally, the I&C personnel with whom the inspector talked expressed pessimism about the quality hotline to resolve such issues and therefore had not used it.

Licensee management responded to the problem vigorously and initiated a nonconformance report, DCO-88-MM-N081 to resolve the problems identified. As corrective action, the licensee will change policy such that problems with procedures for quality related activities are treated as quality problems requiring QC review. The inspectors will follow-up the actions taken by the licensee (Unresolved item 88-19-01).

In addition, at the exit interview, licensee management was encouraged to extend the scope of its review to encompass the reluctance of the I&C technicians to go to the Quality Hotline and other actions necessary to enhance the surfacing of problems which were well known to the craft involved but not acted upon by management and the quality organizations.

g. Unit 1 Overpower Differential Temperature (OPDT) Channel Inoperable

On July 29, 1988, the licensee discovered an OPDT channel to be inoperable due to miscalibration. This event is discussed in more detail in paragraph 9 d. of this report.

h. Unit 1 Reactor Trip When a Main Feedwater Pump Tripped

On August 30, 1988, at 8:42 p.m., Unit 1 experienced a reactor trip from 99% power due to a main feedwater pump trip and the consequent low steam generator level reactor trip signal. The licensee concluded that additional steam was admitted to the main feed pump turbine and an actual overspeed condition was achieved which was terminated by a mechanical overspeed protection device.

The licensee has indicated that the main feed pump speed probe failed in an unexpected way; low vs. high. The suspected failure was different than the feed pump control manufacturer had designed for. The manufacturer designed the control circuitry to sense a speed probe failure, reject the failed (high) speed sensor, and pickup control from the readout of a second, redundant speed probe. The control circuitry was not designed to pickup a speed probe failure low. The licensee forwarded the failed probe to the manufacturer for root cause analysis.

Subsequent to the inspection period, the regional projects Section Chief was contacted by the controller manufacturer. The controller manufacturer indicated that they could not reproduce the speed probe failure. The licensee was informed of the manufacturer's



information. The licensee initiated further investigation of the testing and verification process which will be followed under routine inspection activities.

During the management post trip review, the inspector noted that neither QA or QC were involved. In subsequent discussions with the QC manager, he indicated that he had not been notified of the meeting. The inspector discussed this situation with the plant manager, who committed to ensure QC involvement in plant events was increased.

i. Unit 2 Reactor Trip caused by Seismic Trip Instrumentation Surveillance Testing

On September 1, 1988, at 11:29 a.m., Unit 2 experienced a reactor trip from 100% power due to a seismic trip signal induced while performing scheduled functional testing of the seismic trips. One of the seismic trip channels was in an undetected tripped condition when a second channel was tripped for testing, giving the necessary two out of three coincidence for a reactor trip signal. This particular trip was similar to a March 5, 1988, Unit 2 reactor trip which occurred when the seismic trips were last tested. The licensee had not yet implemented seismic trip design changes to annunciate failed features on the seismic trip channels.

The Vice President, Nuclear of PG&E subsequently directed that a task force be formed to determine the cause of why the design change actions defined in March had not been implemented. He further directed that the scope of the study include aspects of the NRC maintenance team inspection and the 1988 INPO audit regarding weaknesses in the timely implementation of NRC and industry initiatives, as well as learning from the plants own experiences.

On September 3, 1988, Unit 2 achieved criticality.

j. Unit 1 Reactor Trip from 13% Power

On September 1, 1988, at 8:16 p.m., Unit 1 experienced a reactor trip from 13% reactor power during an attempted restart from the August 30, 1988, trip. The trip occurred at the time of latching the turbine generator to begin electrical generation. The turbine trip/reactor trip signal was generated by an anti-motoring protection device on the turbine generator. The root cause of the actuation of the antimotoring device was ultimately determined to be an instrumentation root valve which was closed and should not have been.

The inspector observed that during the post-trip assessment, plant management readily accepted as fact a theory, developed on the backshift, regarding the abnormal condition of governor valve FCV-140. Subsequent questioning by the inspector contributed to the discreditation of the theory and ultimately to the discovery of the closed root valve.



The root valve was added during a refueling outage design change. The fact that the root valve was closed, was documented in an Action Evaluation on August 6, 1988. An Operations shift foreman was informed that the valve was closed at the time. However, upon review by the SFM, no drawings or information could be found to indicate the appropriate position of the valve. The SFM elected not to change the valve position fearing the perturbation might have induced a turbine trip.

A number of weaknesses were identified in this process including drawings which reflected the installation of the new root valve had not been issued prior to startup and it was not recognized that the addition of the root valve required procedure changes. In addition, when it was raised to the shift foreman, adequate priority was not established to assure the valve was placed in the appropriate position or an engineering analysis performed. Further the organization responsible for review of the Action Evaluation did not respond to the problem. As a result, a protective feature was removed from the main turbine/generator (albeit a redundant one) without benefit of engineering analysis of the potential impact of that act.

The inspectors will follow-up the licensee's corrective actions through review of the LERs and NCRs resulting from the three reactor trips described above.

On September 2, 1988, Unit 1 achieved criticality subsequent to the reactor trips of August 30 and September 1.

5. Maintenance (62703)

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. Unit 1 Turbine Governor Valve FCV-140

On August 21, 1988, during testing of the Unit 1 turbine governor valves, as required by technical specifications, the governor valve for steam lead #4, FCV-140, indicated that it was not completely shut. It was discovered that the valve stem was unscrewing from the actuator and had backed off three turns giving a false indication of being 2.9% open when it was actually shut. The licensee performed ultrasonic testing and radiography to determine the cause and discovered that the shear pin had broken, allowing the valve stem to rotate. A design change was issued to change the material of the shear pin to a higher strength material and to drill a new hole in the shaft. The licensee's theory, at this time, was that a lock nut had not been properly torqued at original assembly as evidenced by



the fact that there was a 3 degree misalignment of holes when adequate torque was applied.

In subsequent operation the pin failed again. The licensee's action was to instrument the valve in operation (after another repinning) to determine if vibration or shaft torsion forces are present in a magnitude sufficient to cause damage. The licensee's safety analysis, concurred to by Westinghouse, states that with a failed pin the valve can and will perform its safety function (to shut). As of September 6, 1988, the valve was in service and being monitored.

This item will be followed up in the normal course of inspection activities.

b. Other Maintenance Activities Reviewed

The inspectors also observed or reviewed portions of the following maintenance activities:

- o Reactor coolant pump motor lead terminations.
- o Unit 2 steam generator manway leaks.

No violations or deviations were identified.

6. Surveillance (61726)

By direct observation and record review of selected surveillance testing, the inspectors assured compliance with TS requirements and plant procedures. The inspectors observed or reviewed portions of the following surveillance activities which are addressed in other sections of this report:

- o Overpower differential temperature channel calibration (Paragraph 9.d.).
- o Unit 2 seismic trip (Paragraph 4.j.).
- o Pressurizer differential pressure transmitters (Paragraph 11.c.).
- o Backlog of critical I&C procedure changes (Paragraph 4.f.).

No violations or deviations were identified.

7. Radiological Protection (71709)

The inspectors periodically observed radiological protection practices to determine whether the licensee's program was being implemented in conformance with facility policies and procedures and in compliance with regulatory requirements. The inspectors verified that health physics supervisors and professionals conducted frequent plant tours to observe activities in progress and were generally aware of significant plant activities, particularly those related to radiological conditions and/or



challenges. ALARA consideration was found to be an integral part of each RWP (Radiation Work Permit).

No violations or deviations were identified.

8. Physical Security (71881)

Security activities were observed for conformance with regulatory requirements, implementation of the site security plan, and administrative procedures including vehicle and personnel access screening, personnel badging, site security force manning, compensatory measures, and protected and vital area integrity. Exterior lighting was checked during backshift inspections.

No violations or deviations were identified.

9. Licensee Event Report Follow-up

a. In-Office Review (90712)

Based on an in-office review, the following LERs were closed out by the resident inspector:

Unit 1: 88-16 - Missed Surveillance due to lack of Procedural Guidance

Unit 2: 87-18 - Both Trains of Aux Building Ventilation unavailable on Auto Start Signal

87-20 - Redundant Trains of Aux Building Ventilation Inoperable

87-22 Revision 1 - Fuel Handling Building Ventilation System Shift to Iodine Removal Mode

The LERs were reviewed for event description, root cause, corrective actions taken, generic applicability and timeliness of reporting.

Onsite Review (927001)

The LERs identified below were reviewed in-office, and on-site follow-up inspections were also performed by the inspectors to verify licensee corrective actions.

b. Unit 1 Reactor Trip on July 12, 1988 (LER 50-275/88-21, Closed)

On July 12, 1988, a reactor trip was initiated as a result of a steam generator high-high level during the performance of Operating Procedure OP L-3, "Secondary Plant Startup." The trip was due to an unexpected divergent steam generator level oscillation caused by interaction between the automatic feed water control and steam dump control. This was the first time startup procedure OP L-3 had been performed since it was revised to parallel the generator to the grid



at 18% to 20% power with feed water and steam dump controls in automatic.

The inspector reviewed LER 1-88-21 which described the event and found that the characterization of root-cause could have been more complete in that it described the cause to be an inadequate procedure since it required feedwater control to be placed in automatic prior to paralleling. A more complete description of root-cause would have added that at 20% power, unexpected oscillations of steam generator level occurred with both feedwater regulation and steam dump controls in automatic. An additional salient fact not discussed in the LER was that the procedure was found to be adequate by all operating crews when it was used in startup training on the simulator.

Following the event, the inspectors found the licensee's event analysis to be acceptable and complete. However, the full extent of the analysis was not discussed in the LER. Analysis determining why the oscillation occurred and the analysis performed to demonstrate that the oscillations could not have been reasonably anticipated were not addressed in the LER.

These findings were discussed with the licensee who committed to brief those involved in LER preparation. In general, the inspectors have found the licensee's LERs to be of high quality. This LER, although not inadequate, was considered of marginal quality.

c. Loss of Both Trains of Unit 1 Auxiliary Building Ventilation (LER 50-275/87-28, Closed)

In review of the LER and nonconformance report (NCR) for a December 30, 1987, temporary loss of both trains of auxiliary building ventilation, the inspectors identified a number of inadequacies in the licensee's nonconformance review.

- o Although the root cause was determined to be personnel error by a work planner in writing the clearance, neither the individual nor any individual from the work planning department, was present during the review of the nonconformance.
- o Although one corrective action stipulated that the event be reviewed with the work planning clearance personnel, this was not done.

These findings were discussed with the licensee in April of this year. The licensee committed to have all individuals involved or otherwise responsible for an event attend the review of NCRs. The inspector has noted that this commitment has been implemented. In addition the incident was re-reviewed by the licensee and the work planning personnel were briefed on the results. This item is closed.



d. Failure to Meet Unit 1 Technical Specification Limiting Conditions for Operation for Inoperable Reactor Trip System Instrumentation Channel due to Personnel Error LER 50-275/88-24 (Open)

This LER was submitted because on June 16, 1988, an I&C technician performing the functional test STP-I-5B2, "Channel Calibration: OTDT, OPDT, T(AVG), and Delta T," misapplied a compensating voltage which had the net result of making one of four redundant trip channels for overpower-delta-temperature (OPDT) inoperable.

The channel remained inoperable for 21 days (from the time the unit went critical on July 7, 1988) and was discovered during a recalibration on July 29, 1988 to accommodate changes to programmed T(AVG). During the 21 days, no transients occurred which would have called on the channel to act, and at least 2 channels remained operable. The licensee concluded that the health and safety of the public was not affected.

The LER was issued on August 29, 1988, by the Vice President Nuclear to the NRC and stated in determination of the root cause of the event that:

"The root cause analysis have concluded that test procedures were adequate and would not have prevented this event from occurring. The technician involved in the event was experienced, highly qualified, and had successfully performed this STP on other channels the same day. Human factors were evaluated but no contributing factors were revealed. Based on this analysis, no corrective actions to procedures or training were recommended."

The inspector discussed this LER with the I&C manager related to the conclusion that no corrective action was determined, noting that two corrective actions appeared to be possible and reasonable. One typical action would be to have an acceptance test for each critical portion of a calibration to ensure the input produces the expected output. Secondly, since the error was made by a single technician, increased independent verification of critical activities appeared to be a possible productive corrective action.

The I&C manager stated that the nonconformance report on the event (NCR DC1-88-TI-N084) was not closed and was still being analyzed to determine corrective actions. He further stated that the LER was issued in its form because the 30 day reporting deadline had drawn to a close. The inspector considered that the LER should not have been issued by upper management without a meaningful root cause and corrective action or a statement to the effect that a revised LER would be issued when the root cause and corrective actions were adequately determined.

Subsequent to this discussion, the Regulatory Compliance Supervisor indicated that a revised LER would be issued. The NRC has formally requested a revision to the LER in the cover letter of this report.



Additionally, the failure to meet technical specifications described in the LER is being considered as a potential violation based on the lack of corrective actions taken by the licensee. This matter is considered unresolved at this time (Unresolved Item 50-275/88-21-01) pending determination of the technical significance of the item and adequacy of the licensee's corrective actions.

No violations or deviations were identified.

10. Independent Inspection

a. Licensee Program for 1) Consideration of Design Bases in Decision Making and 2) System Engineers (5-37700-1, 5-35701-1)

During the past year, the resident inspectors and regional staff and management have focused attention on the issue of the adequacy of the licensee's understanding of the plant's design bases in decision making.

The NRC has found that the licensee's program for defining a clear design bases and imparting that information to site personnel has been slow. The licensee has committed to define a plan and schedule for the accomplishment of two tasks designed to ensure design bases are maintained in the operating plant. Those tasks are the definition and implementation of a system engineer program and the development of a design bases document.

Several of the inspection reports in the preceding year provide examples of incidents which underline the need for action in this area. These include:

- o 50-323/87-39 dealing with flame heating of stainless steel piping causing sensitization,
- o 50-275/87-38 dealing with spent fuel pool radiation monitor recorders design not implemented in Unit 1 or 2,
- o 50-275/87-42 dealing with the installation of permanent test gages without a design change. The same report describes the disabling of a required pipe support during operation because personnel did not understand its design function,
- o 50-275/87-44 dealing with loss of design configuration control specifically missing seismic restraints for reactor trip breakers, chart recorders, and hydrogen monitors,
- o 50-275/88-07 dealing with missing seismic bracing on Unit 2 Vital batteries,
- o 50-275/88-11 dealing with anomalies between the ASW design



bases and plant procedures and alarm setpoint; additionally, licensee progress in the area of a system engineering program was examined,

- o 50-275/88-14 management meeting dealing with design bases,
- o 50-275/88-17 dealing with configuration management.

The licensee's progress in this area will be periodically statused as part of the routine inspection program.

b. Licensee Program for Action Requests (5-92700-2)

Since the team inspection of 1987, (Report 50-275/87-01) the resident inspectors and the regional staff and management have examined the licensee's actions regarding maintenance backlog and the action request program. The problems identified were:

- o The licensee did not have a good assessment of the amount of backlog or its trend. This was attributable to a lack of management and Quality Assurance oversight of the process.
- o Certain departments (e.g. Operations) appeared to lose confidence in the ability of the action request system as an effective means of getting problems resolved and consequently were not using the system to report and correct problems.

The following inspection reports and records of management meeting are a partial list of the reports which dealt with the subject of action requests:

- o 50-275/88-15 1988 Maintenance Team Inspection
- o 50-275/88-07 Resident Inspection
- o 50-275/88-14 April 26, 1988, Management Meeting
- o 50-275/87-40 Project Inspection
- o 50-275/87-37 Project Inspection
- o 50-275/87-12 March 6, 1987, Management Meeting

The licensee has increased management attention in this area in regards to redefining action request priorities for simplicity and clarity, as well as tracking the amount and age of backlogged items.

Progress in the action request area is being made; however, the licensee has not yet fully developed an effective program for backlog reduction as evidenced by the size of the backlog and the perception of frustration expressed to the 1988 Maintenance team members.

An additional problem noted in the handling of action requests is described in this report. Specifically, paragraph 4.f. discusses action requests for necessary I&C procedure changes not processed satisfactorily.



This area will continue to be monitored by the NRC for improvements in the reduction in backlog and for effective management and quality assurance oversight of the process.

c. Differential Pressure Transmitter Calibration (61726)

On July 25, 1987, regional management reported a problem which had occurred at the Trojan plant, and inquired as to the status at Diablo Canyon. The problem at Trojan was that differential pressure transmitters which were calibrated in a shop were not controlled as to the physical orientation at the time of calibration and the field orientation was sometimes different than the shop orientation, inducing an error. In discussion with the I&C manager, the inspector concluded that at Diablo Canyon, a final field calibration check is performed which should detect any induced error from misorientation in the calibration lab.

No violations or deviations were identified.

11. Open Item Follow-up (92701) and 92702)

a. Failure to Follow Jumper Procedure (Enforcement Items 50-275/87-20-01, Closed)

The inspector followed up the actions taken by the licensee in response to a notice of violation with regard to a May 14, 1987, diesel generator start due to the installation of a jumper across the wrong terminals. The licensee's letter of response dated July 31, 1987, lists five corrective actions. The inspector verified that each had been initiated. Item 4. of the response refers to actions to be taken by the licensee to revise loop tests as necessary to meet the guidance provided in ANSI Standard N18.7-1976. To accomplish this at the beginning of this year, the licensee increased its I&C engineering staff. Progress in I&C procedural improvement will be followed during routine surveillance inspections. This item is closed.

b. Informal Communications (Follow-up Item 50-275/87-04-04, Closed)

The issue of informal communications taking place between operations and maintenance/I&C personnel or reviewer/review group and individuals involved in work or events has been a subject of a number of management meetings and correspondence. Corrective actions have been taken in the area such as requirements on work orders and some procedures to have the shift foreman sign prior to and following work. Improvements have also been made in the documentation of corrective maintenance work performed enabling reviewers to better determine root cause. In addition whenever possible, reviews of nonconformances include the person involved in the work or event.

Although the licensee's performance has improved in this area, events such as the July 25, 1988, main steam isolation due in part



to inadequate communications indicate that licensee attention is still warranted. This item is closed.

c. CFCU Condensate Collection System (Unresolved Item 50-323/87-45-02, Closed)

The inspector reviewed the licensee's revised annunciator response procedure for the Containment Fan Cooler Condensate Collection System and found the acceptance criteria acceptable. The criteria appears adequate to allow detection of RCS leak rate as low as one gallon per minute in one hour as stated in Regulatory Guide 1.45. In addition, the procedure includes conservatism and is simple to use. This item is closed.

d. Enforcement Items Closed Based on Licensee Response

For the following enforcement items, the inspector performed an in-office review of the licensee's response to the Notice of Violation or Deviation. The responses were found to be acceptable in that corrective actions proposed addressed the root cause and related issues. In addition, in some instances, the inspector reviewed related procedure revisions, incident summaries, and nonconformance reports. Based on these reviews the items listed below are closed:

Unit 1:

- 88-07-01 Overpressurization of the RCDT
- 88-07-02 FME on the Reactor Vessel Head
- 88-11-01 Spectacle Flange Gasket Replacement
- 88-11-03 Ineffective corrective actions with respect to cleanliness issues

Unit 2:

- 88-03-03 RCV-16 Stroke time
- 87-38-03 Recorders for RE 58 & 59

e. Follow-up Items 50-275/88-04-01, Auxiliary Control Board Annunciator Procedures (Open)

The inspector examined the status of licensee actions in regards to this item with the Operations Manager. This item dealt with the fact that the operators at the auxiliary boards in the Auxiliary Building had developed annunciator response procedures approximately three years ago but had not formalized the procedures in terms of formal issuance and change control. The operations manager stated that a formal schedule for issuance of the procedures had not been determined but that the procedures would probably be issued by the end of 1988.

This item remains open.



f. Unresolved Item 50-323/87-38-04, Seismic Hazards (closed)

This item dealt with equipment left by maintenance personnel in a location which might cause damage to safety equipment should a seismic event occur. In general, the inspectors considered that the site worker sensitivity to creating seismic hazards was low and increased management attention was warranted.

The licensee performed calculations to demonstrate that the turbine casing parts located by the control room pressurization system would not have made the control room pressurization system inoperable should a seismic event have occurred. These calculations are documented in a memorandum (Tressler to Townsend) dated June 8, 1988, and were reviewed by the inspector. Also, a safety analysis was previously reviewed regarding waste drums stacked near safety ventilation dampers in Engineering Work Request EWR 0-87-464 issued February 9, 1988.

Additionally, plant management had initiated actions to increase plant staff awareness and sensitivity to seismic issues including upgraded General Employee Training, additional QC surveillances and a campaign of posters highlighting seismic hazards.

The unresolved item was determined not to be a violation due to the licensee analysis which concluded that equipment would have remained operable. Therefore, this item is closed.

g. Enforcement Item 50-275/86-29-04, Corrective Actions for Containment Airlock Doors (Closed)

The plant manager provided a status report dated July 12, 1988, to the Senior Resident Inspector on August 12, 1988. The status report stated that the licensee had decided to make eight modifications. These were to upgrade the interlock stop pins, replace the door pressure gages, install torque limiters on handwheels, add door shock absorbers, improve alarms, add a door viewport, relocate door test clamps, and revise the operating and maintenance manual.

The first two items were scheduled for accomplishment during the Unit 2 second refueling outage in September 1988. The plant manager stated that the remaining items would be accomplished during the third refueling outages for Units 1 and 2.

This item is considered closed.

12. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved items disclosed during this inspection are discussed in Paragraph 4.f and 9.d of this report.



13. Exit (30703)

On September 16, 1988, 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.

