

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/89-17; 50-323/89-17

Docket Nos. 50-275; 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: June 5-9, 1989

Inspector:

Charles Ramsey
C. Ramsey, Regional Inspector

7/7/89
Date Signed

Approved by:

D. Kirsch
D. Kirsch, Chief
Reactor Safety Branch

7/10/89
Date Signed

Summary:

Inspection during the period June 5-9, 1989 (Report Nos. 50-275/89-17 and 50-323/89-17)

Areas Inspected: Routine unannounced inspection by one regional based inspector involving an assessment of the routine fire protection program, and follow-up on previous NRC and licensee identified open items. During this inspection, Inspection Procedures 30703, 64704, 64150 and 92701 were used.

Results:

General Conclusions and Specific Findings:

The licensee's emphasis on maintaining safe shutdown capability in the event of fire has apparently been remiss. One significant example of this was identified during this inspection (availability of the positive displacement pump as a redundant to the centrifugal charging pumps).

The licensee's established program for responding to exterior wildland fire occurrences which represent significant challenges to the plant's nuclear safety systems, appears to be effective in mitigating the adverse consequences of these occurrences. This was evidenced by successful containment and extinguishment of a major wildland fire occurrence in the vicinity of the plant on May 23, 1989.

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The management staff appears to be generally involved in routine implementation of fire protection program requirements. Organizational and personnel responsibilities are clearly delineated in administrative procedures. Senior management involvement and support appears to be evident through the budgeting and prioritization of major and minor fire protection enhancement modifications. However, increased emphasis appears to be warranted in the area of additional training of the management staff on the specifics of fire protection that impact various areas of management responsibility.

The licensee's fire protection compliance evaluations are not complete. This effort continues to be ongoing. The Generic Letter No. 86-10 compliance evaluations appear to be causing the license difficulty due to the lack of specificity provided in the guidelines of the generic letter. In some cases where the licensee determined that the guidelines of the generic letter were applicable, a conflict exist with the requirements of 10 CFR 50.72 and/or 10 CFR 50.73 reporting requirements. This has resulted in delaying the licensee's completion of the evaluations for specific cases (i.e. fire barriers). In these cases, there is indecision on the licensee's part as to whether an evaluation, a plant modification, or a license amendment request is appropriate for resolving these plant conditions.

Significant Safety Matters:

Summary of Violations: None

Summary of Deviations: None

Summary of Open Items: Two previous open items remain open. Four new open items and one new unresolved item were identified.



DETAILS

1. Persons Contacted

Pacific Gas and Electric Company

- *L. Womack, Assistant Plant Manager - Operations Services
- *P. Powell, Supervisor, DOC Services
- *C. Eldridge, Quality Control Manager
- *S. Fridly, Operations Manager
- *R. Flohaug, Quality Assurance Supervisor
- *R. Kohout, Emergency Safety Services Supervisor
- *P. Kao, Nuclear Engineering
- *J. McClintock, Fire Protection Specialist
- *C. Johnson, Fire Marshal
- *B. Kelly, Regulatory Compliance
- *J. Hinds, Regulatory Compliance
- *B. Giffin, Technical Services
- R. Panero, Fire Protection Engineer
- T. Pellisero, Senior Power Production Engineer
- D. Koehler, Senior Control Operator
- R. Carvel, Quality Assurance Auditor
- J. Becker, Shift Supervisor

NRC

- *K. Johnston, Resident Inspector

*Denotes those attending the exit meeting held on June 9, 1989.

2. Licensee Actions on Previous Inspection Findings (92701)

A. (Open) Open Item 275/87-27-02 "Fire Alarm System Deficiencies"

Extensive modifications are being made to upgrade the fire alarm system. The modifications have been prioritized into three phases. Phase I consist of alarm circuit modifications and is complete. Phase II consist of alarm system and computer consolidations, and is approximately eighty percent complete. Phase III consist of expanding the alarm system to site out buildings and is scheduled to be completed in late 1989.

This item will remain open pending further licensee action and additional NRC review.

B. (Open) Open Item 275/87-27-04 "Generic Letter 86-10 Evaluations"

The licensee continues to have difficulty with interpretations of the guidelines specified in NRC Generic Letter No. 86-10. Apparently, certain aspects of the generic letter guidelines are not clear in that they do not specify criteria for performing the compliance evaluations. In some instances, the evaluations involve conditions that are described in supplemental SER's which are



referenced as license conditions in license amendments. In these cases, the licensee is not certain whether the criteria of 10 CFR 50.59, 10 CFR 50.72 and 10 CFR 50.73 are applicable. The licensee indicated that it was not clear that the generic letter intended to grant relief from these regulatory requirements for which the licensee considers minor fire protection conditions.

To resolve this issue, the licensee indicated that additional review of the conditions will be performed using the criteria of the appropriate NRC regulations and a determination made as to whether plant modifications have to be made, or a license amendment request submitted to the NRC.

This item will remain open pending further licensee action and region V review.

C. (Closed) LER No. 323/89-03, "Missed Surveillance For New Fire Protection Valves Due to Inadequate Procedure".

This LER reported the licensee's failure to verify the operability of certain fire protection water supply valves which are required to be operable pursuant to Technical Specification 4.7.9.1.c. The valves provide isolation for automatic sprinklers located in the charging pump rooms, and were installed as part of a design change to provide a backup cooling water source to the charging pump lubricating oil and seal coolers from the fire protection water supply.

Subsequent to the licensee's failure to satisfy the Technical Specification requirements for the valves, the licensee stated in LER No. 89-03 that although the valves were not verified operable pursuant to the Technical Specification requirements, they were found open, in the required position. The licensee further demonstrated during the inspection through a review of records that the valves had not been closed and thus would have properly functioned during the period that they were not verified operable.

The licensee indicated in LER No. 89-03 that the cause of this condition was inadequate procedural guidance and communications between engineers responsible for plant design changes. Based on the inspector's review, it appears that the licensee appropriately characterized the cause of this condition, and the licensee is in the process of implementing corrective action. This is further discussed in paragraph 3.A. below. On this basis, this item is considered closed.

3. Partial Reassessment Of Safe Shutdown Capability (64150)

As a follow-up to the facility's design for 10 CFR 50, Appendix R compliance for post-fire safe shutdown as detailed in the facility FSAR, the inspector performed a partial review of the licensee's control mechanisms for maintaining this capability. Since the original NRC Appendix R inspection in 1985, the licensee has performed numerous plant modifications. During this review, the licensee acknowledged that



subsequent to the original NRC Appendix R inspection, other than the 10 CFR 50.59 review criteria, the licensee had no configuration management program in place. According to the licensee, a configuration management program is currently in the process of being implemented.

The review identified that the licensee's computer listing of plant modifications over the past four years did not contain sufficient information to determine whether a particular modification impacted Appendix R compliance or the facility's design for safe shutdown. The licensee acknowledged this condition and indicated that the only consistent method of making this determination is through the review of hard copy design change packages for individual modifications. Because of the number of design change packages involved, the focus of this review shifted to the licensee's existing design change program specified in Administrative Procedures C-40 and C-1 S1. The results of this review are as follows:

A. Inadequate Procedural Guidance/Communications

In accordance with the criteria of 10 CFR 50.59, the licensee modified the Auxiliary Building fire protection water supply system so that this water supply could provide a backup source of cooling water to the charging pump lube oil and seal coolers in the event of a loss of component cooling water. The modification was performed as specified in Design Change Package (DCP) Nos. M-41009 and M-42009. The DCPs indicated that an Appendix R review had been completed. However, two fire protection water supply system isolation valves that were part of the modification, and governed by Technical Specification 4.7.9.1.c. were declared inoperable by the licensee because the valves had not been verified operable upon completion of the modification. The licensee identified the cause of this omission in LER No. 323/89-03, as inadequate procedural guidance and inadequate communication among engineers involved in plant design changes.

The licensee's internal Quality Assurance Audit No. 89805T identifies the lack of adequate procedural guidance in plant design changes as the cause of the fire protection water supply system valve omission associated with DCP Nos. M-41009 and M-42009, in addition to a modification to the Residual Heat Removal System that was implemented by DCP No. M-36469. This DCP required an Appendix R review, but originally indicated that none was required.

As stated in LER No 323/89-03, the licensee is implementing corrective actions for these conditions through procedural changes, re-delegation of design review responsibilities, and additional reviews for post-modification testing. In addition, the licensee is in the process of implementing a configuration management program.

The licensee's planned corrective actions appear to be measures that may adequately address future concerns in this area, provided that knowledgeable individuals of the appropriate discipline are properly involved in the design review process in a manner that satisfies the provisions of Technical Specification 6.8.1. Further NRC review of



this is required. In addition, the adequacy of past design control measures and the integrity of the facility's design for post-fire safe shutdown will be reviewed during subsequent NRC inspections. On this basis, this is considered an Open Item (275/89-17-01) pending further NRC action.

B. Out of Service Positive Displacement Pump - Redundant to Centrifugal Charging Pumps

The licensee's safe shutdown analysis (FSAR section 9.5A) takes credit for the positive displacement pump as a redundant to the centrifugal charging pumps. Since a single fire could cause the loss of power to all three charging pumps (in either unit), the analysis takes credit for the ability to use the positive displacement pump in lieu of the centrifugal charging pumps, because the analysis assumes that the positive displacement pump will not be damaged by the same fire. Although the positive displacement pumps at Diablo Canyon are not governed by the requirements of Technical Specifications, SER Supplement No. 23 found this an acceptable method to satisfy the safe shutdown criteria of Appendix R.

Section III.G.2 of Appendix R requires that one train systems, cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage. According to information provided to the inspector by the licensee, the positive displacement pumps have had a consistent out-of-service history. During the periods that the positive displacement pumps have been out of service (i.e., the unit 1 pump power supply breaker history indicate that the unit 1 pump has been out of service for extended periods of 2 to 180 days, seven times over the past two years. The unit 2 pump power supply breaker indicate that the unit 2 pump has been out of service for extended periods of 2 to 16 days eight times over the past two years, and was out of service at the time of this inspection), if a fire had occurred and damaged the power supplies to the centrifugal charging pumps of the affected unit, the safe shutdown criteria of Appendix R for maintaining the reactor coolant level within the level indication of the pressurizer may not have been satisfied.

In response to this concern, the licensee acknowledged the significance of this condition and indicated that consideration would be given to placing administrative limitations on the periods that the positive displacement pumps could be out of service without compensatory measures similar to those contained in Technical Specifications. Subsequent to this inspection, the licensee provided region V with "Justification for Continued Operation No. 89-13", which implemented this administrative action. While this action by the licensee appears to provide additional compensating measures during periods that the positive displacement pumps are out of service, it is not consistent with the NRC's Generic Letter Nos. 81-12 and 88-10 request for proposed Technical Specifications for this Equipment.



Additionally, the licensee has implemented Abnormal Operating Procedure No. OP AP-17, "Loss of All Charging"; which instructs plant operators to respond to this condition by analyzing the symptoms of the reactor coolant system. The inspector raised the concern that the instructions in the procedure appeared to be outside of the design basis of the FSAR Fire Hazard Analysis, as well as the design basis events of Chapter 15 of the FSAR. On this basis, this is considered an Unresolved Item (275/89-17-02) and is being referred to NRR for resolution.

C. Backup Centrifugal Charging Pump Seal Injection From Fire Water Supply Modification

Since the original NRC Appendix R inspection in 1985, the licensee has implemented an enhancement modification to the centrifugal charging pumps that provides a backup source of cooling water for the charging pump lubricating oil and seal coolers from the fire protection water supply. Based on the inspectors review, although not required by NRC regulations, this modification appears to strengthen the licensee's safe shutdown capability in the event of a loss of component cooling water to the charging pump lubricating oil and seal coolers. Questions were raised concerning the design review process for this modification. This is further discussed in paragraph 3.A. above.

D. Operator Training in Post Fire Safe Shutdown

According to the licensee's operator training records and training lesson plans, licensed and non-licensed operators receive training to qualify on post-fire safe shutdown abnormal emergency procedures every 2 years as part of NRC required requalification examinations. For "Control Room Inaccessibility", due to fire, smoke, heat, chlorine, high radioactivity or other occurrences, the licensee's Abnormal Operating Procedure No. OP AP-8 is an event based procedure which specify operator actions for these prevailing conditions. Where fire or other unknown events cause equipment failures, symptom based abnormal operating procedures such as the licensee's Abnormal Operating Procedure No. OP AP-17, "Loss of All Charging", specify operator actions for these prevailing conditions.

Licensed operators interviewed by the inspector appeared to be sensitive and knowledgeable of actions required of them to implement procedures for post fire safe shutdown. One illustration of the knowledge and sensitivity of the operators was the inspector's postulated scenario of a fire occurring and disabling power to all three charging pumps, while the positive displacement pump on the affected unit was out of service. The operators acknowledged that Step No. 24 of Abnormal Operating Procedure No. OP AP-8, directed them to establish pressurizer level control by establishing charging from the centrifugal charging pumps or the redundant positive displacement pumps, as specified in the facility FSAR Fire Hazard Analysis.



With both the centrifugal charging pumps and the positive displacement pump of the affected unit inoperable, the operators referenced the licensee's Abnormal Operating Procedure No. OP AP-17, "Loss of All Charging", which instructs operators to respond to the symptoms of this event based on the condition of the reactor coolant system. The operators and the licensee's operator training staff recognized that this procedure was not a standard Westinghouse Emergency Procedure, and the instructions contained in the procedure were outside of the design basis events of Chapter 15 of the FSAR, and also outside of the FSAR Fire Hazard Analysis for Appendix R compliance. Inspector concerns regarding the adequacy of this procedure are further discussed in paragraph 3.B. above.

4. Routine Program Implementation Assessment (64704)

The organizational and personnel responsibilities for implementing the fire protection program requirements are delineated in the licensee's Administrative Procedure No. NPAP A-13. This delegation of responsibility takes an integrated approach to incorporating fire protection/prevention into all aspects of plant operations. Responsible individuals of corporate and site organizations are assigned daily tasks that are designed to effectively implement various aspects of the program.

In a meeting with these licensee representatives on June 8, 1989, the licensee's representatives discussed past and current fire protection issues and their respective level of involvement in the resolution of those issues with the inspector. Based on the inspector's assessment of these discussions, it appeared that the individuals delegated responsibility for the program's implementation are involved in the daily administration of the program. Each meeting participant demonstrated a degree of knowledge of the fire protection/prevention issues that were discussed, by expressing relevant aspects of the issues that affected their respective organizations. Senior management involvement and support appeared to be evident through the budgeting and prioritization of fire protection enhancement modifications that have been, or are in the process of being completed. There appeared to be lines of communication and interaction established between corporate and site organization. However, the communications and some aspects program implementation between site organizations are in the process of being improved as follows:

A. Additional Training of Operations Staff

During the May 23, 1989 wildland fire occurrence, notification of the offsite fire department was delayed due to the lack of specificity of Emergency Procedure No. EP M-6, "Nonradiological Fires". The procedure directed the shift foreman to notify the California Department of Forestry via a "Tie Line" telephone number or, notify the county sheriff's office within 15 minutes of the declaration of an "Unusual Event". The May 23, 1989 wildland fire occurrence was declared an "Unusual Event". Therefore, per the procedure, the shift foreman elected to notify the county sheriff's



office and requested that the sheriff's office notify the California Department of Forestry to respond to the fire.

The notification to the California Department of Forestry was delayed by 10 to 15 minutes because department of the sheriff's office which received the "Unusual Event" notification followed procedures to notify other state agencies of the event prior to notifying the California Department of Forestry to respond to the fire.

To correct this deficiency, the licensee indicated that Emergency Procedures would be revised to instruct personnel to notify the California Department of Forestry via the "911" phone system.

Another observation made by the licensee during this event was the shift supervisor's incorrect assumption that the NRC resident inspector onsite at the time would provide updates of the event to Headquarters NRC Operations via the "Red Phone".

To correct this deficiency, the licensee indicated that Emergency Operating Procedures and operator training would be revised to require appropriate NRC notifications by licensee personnel. This corrective action will emphasize to operations personnel that reliance on NRC Inspectors for this purpose is not permitted under any circumstance.

The licensee's planned corrective actions for the above deficiencies appeared to be appropriate. On this basis, this is considered an Open Item (275/79-17-03) pending further licensee action and region V review.

B. Corrosion of Fire Water System Piping

The licensee's routine maintenance activities during the period September 12, 1986 through December 30, 1988, identified conditions of accelerated corrosion of fire water system piping that resulted in reduced wall thickness of the piping. Although the licensee determined that this problem was limited to the Turbine Building areas, the licensee recognized that much of the fire water system piping is comprised of carbon steel piping. Oxygen is frequently introduced into the fire water system during operation and maintenance; and, the ph of the fire water system has been found to be slightly acidic. Therefore, the licensee further determined that the right conditions exist to result in increased corrosion rates in other parts of the system.

To address this concern, the licensee initiated a comprehensive maintenance evaluation of the fire water system at 48 locations. Based on this evaluation, 11 fire water supply lines in the Turbine Building contained corrosion sediment and suspended particles. However, the licensee determined that this portion of the system would have performed its intended function if called upon because no blocked automatic sprinkler heads were discovered during operability checks. The Auxiliary Building fire water systems examined during



this maintenance evaluation contained no corrosion sediment or suspended particles, but the licensee is currently performing an engineering evaluation to determine the extent that a corrosion problem could exist in this piping.

Based on the inspector's review of the licensee's response to this concern, it appears that the licensee has initiated an appropriate course of action for this problem at this time. On this basis, this is considered an Open Item (275/89-17-04) pending further licensee action and region V review.

C. Sealing of Fire Barrier Penetration

In response to NRC Information Notice Nos. 88-04, 88-56 and 89-52, regarding sealing devices for fire barrier floor/wall penetration openings (dampers, doors and sealing materials), the licensee is currently performing evaluations to determine the extent that these generic problems exist at Diablo Canyon. Since the licensee's analysis was incomplete, no determination was made by the inspector regarding the adequacy of the licensee's sealing devices for fire barriers during this inspection. On this basis, this is considered an Open Item (275/89-17-05) pending further licensee action and region V review.

D. Halon Automatic Fire Suppressant

With regard to safety related or safe shutdown systems which are protected from fire damage by automatic halon fire suppression systems, the inspector discussed with the licensee the potential for replacing this gaseous fire suppressant due to environmental concerns for the release of hydroflouorocarbons into the atmosphere. The licensee acknowledged this concern and indicated there are at least two situations where safety related and safe shutdown components are protected by this fire suppressant at Diablo Canyon. For each of these situations, the licensee indicated prior NRC approval would be sought before the halon fire suppressant is replaced. This was viewed as an appropriate response by the inspector.

5. Open Items

Open items are matters that have been discussed with the licensee, that will be reviewed further by the inspector, and that involve some action on the part of the NRC, the licensee, or both. Open items disclosed during the inspection are discussed in paragraphs 2.A., 2.B., 3.A., 4.A., 4.B. and 4.C.

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, or items of noncompliance, or deviations. An unresolved item disclosed during this inspection is discussed in paragraph 3.B.



7. Exit Meeting (30703)

An exit meeting was held with the licensee's staff on June 9, 1989. The items of concern in this report were discussed at that time. The licensee acknowledged the scope and content of the inspection findings.

