UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

May 1, 2003

Gregory M. Rueger, Senior Vice
President, Generation and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 3
Avila Beach, California 93424

SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT TRIENNIAL FIRE PROTECTION INSPECTION REPORT 50-275/03-02; 50-323/03-02 NON-CITED VIOLATION

Dear Mr. Rueger:

On January 31, 2003, the NRC conducted an inspection at your Diablo Canyon Nuclear Power Plant, Units 1 and 2. Review of additional documentation provided to the NRC subsequent to the onsite inspection was performed from February 4 - 7, March 3 - 7 and April 1 - 4, 2003. The enclosed report documents the inspection findings, which were discussed on March 18, 2003, with Messrs. J. Becker, Vice President, Diablo Canyon Power Plant and Station Director, L. Womack, Vice President, Nuclear Services, and other members of your staff.

This triennial fire protection inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

This report documents a finding concerning the ability of operators to perform actions outside the control room within analyzed time limits, in the event of a control room fire and remote shutdown. The significance of this finding has not yet been determined but is known to be at least Green (very low safety significance). The issue has no immediate safety impact, as the licensee took compensatory measures which will remain in place until long term corrective measures are implemented. The NRC has determined that this finding involves a violation of NRC regulations. If you contest the violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Diablo Canyon Nuclear Power Plant, Units 1 and 2 facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Charles S. Marschall, Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Dockets: 50-275; 50-323
Licenses: DPR-80; DPR-82

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	50-275; 50-323
Licenses:	DPR-80; DPR-82
Report No.:	50-275/03-02; 50-323/03-02
Licensee:	Pacific Gas and Electric Company
Facility:	Diablo Canyon Nuclear Power Plant, Units 1 and 2
Location:	7 ½ miles NW of Avila Beach Avila Beach, California
Dates:	January 13 - 17 and 27 - 31, 2003
Team Leader	R. L. Nease, Senior Reactor Inspector Engineering and Maintenance Branch
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	J. Taylor, Reactor Inspector Engineering and Maintenance Branch
Approved By:	Charles S. Marschall, Chief Engineering and Maintenance Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000-323-03-02; IR 05000275/323-03-02; Pacific Gas and Electric Company; 01/13-31/2003; Diablo Canyon Nuclear Power Plant, Units 1 and 2; Triennial Fire Protection Inspection.

The inspection was conducted by a team of three regional inspectors and one resident inspector. The inspection identified one unresolved item, which was a violation of NRC regulatory requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

Cornerstone: Mitigating Systems

- TBD. Two examples of a violation of the Diablo Canyon Nuclear Power Plant, Units 1 and 2, Technical Specifications, Section 5.4.1.d, were identified for failure to establish, implement, and maintain adequate procedures covering fire protection program implementation.

  Example 1: The licensee failed to adequately implement fire protection program requirements specified in Calculation M-944 "10 CFR 50 Appendix R, Alternate Shutdown Methodology Time and Manpower Study/Safe Shutdown System Considerations." Specifically, in a control room fire scenario requiring control room evacuation and remote shutdown, operators failed to complete actions required for achieving safe shutdown specified in Procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," within the times assumed in Calculation M-944.

  This finding is unresolved pending completion of a significance determination. This finding was of greater than minor significance because it impacted the mitigating systems cornerstone and adversely affected the ability of the licensee to manually operate certain components required for safe shutdown within the analyzed times. Specifically, in a simulated field walkdown, operators were not able to establish auxiliary feedwater within 30 minutes as required by analysis.

  Example 2: The licensee failed to adequately implement fire protection program requirements for a fire in the control room requiring control room evacuation and remote shutdown. Specifically, the licensee failed to provide adequate information in procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," or on the Unit 2 hot shutdown panel concerning the correct hot shutdown panel switch positions of certain

components required for safe shutdown. Consequently, in stepping through procedure OP AP-8A, operators failed to transfer control of the auxiliary feedwater throttle valves and steam generator atmospheric dump valves from the control room to the hot shutdown panel.

This finding is unresolved pending completion of a significance determination. This finding was of greater than minor significance because it impacted the mitigating systems cornerstone and adversely affected the ability of the licensee to take control of certain components required for safe shutdown. Specifically, information identifying the correct hot shutdown panel switch positions for the auxiliary feedwater throttle valves and steam generator atmospheric dump valves were not provided to the operators. During a control room fire and remote shutdown, if not placed in the correct positions, these components would have remained vulnerable to fire damage that could cause spurious operation.

Report Details

1. REACTOR SAFETY

1R05 Fire Protection

The purpose of this inspection was to review the fire protection program for selected risk significant fire areas. Emphasis was placed on verification of the licensee's post-fire safe shutdown capability. The inspection was performed in accordance with the new Nuclear Regulatory Commission (NRC) reactor oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team used the Individual Plant Examination of External Events Report for Diablo Canyon Power Plant Units 1 and 2 in Response to Generic Letter 88-20, Supplement 4 dated June 1994 to choose several risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

- Fire Area 7A, cable spreading room
- Fire Area TB5, Fire Zone 13B, 4.16 kV switchgear room, G Bus
- Fire Area TB7, Fire Zone 14E, Unit 1 component cooling water heat exchanger room
- Fire Area TB7, Fire Zone 14A, 85 foot elevation of the turbine building

For each of the selected fire areas, the team focused the inspection on fire protection features and on the systems and equipment necessary for the licensee to achieve and maintain safe shutdown conditions in the event of a fire in those fire areas.

Documents reviewed by the team are listed in the attachment.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

To ensure that at least one post-fire safe shutdown success path was available in the event of a fire in each of the selected areas, the team reviewed the functional requirements identified by the licensee as necessary for achieving and maintaining hot shutdown conditions. The team reviewed piping and instrumentation diagrams of systems credited in accomplishing safe shutdown functions to independently verify whether the licensee's shutdown methodology had properly identified the required components. The team focused on the following functions that must be ensured to achieve and maintain post-fire safe shutdown conditions.

- Reactivity control capable of achieving and maintaining cold shutdown reactivity conditions,
- Reactor coolant makeup capable of maintaining the reactor coolant inventory,

- Reactor heat removal capable of achieving and maintaining decay heat removal,
- Supporting systems capable of providing all other services necessary to permit extended operation of equipment necessary to achieve and maintain hot shutdown conditions.

A review was also conducted to ensure that all required electrical components in the selected systems were included in the licensee's safe shutdown analysis. The team identified the systems required for each of the primary safety functions necessary to shut down the reactor. These systems were then evaluated to identify the systems that interfaced with the fire areas inspected and were the most risk significant systems required for reaching both hot and cold shutdown conditions. The systems selected for review were the auxiliary feedwater system, the chemical and volume control system, and the component cooling water system.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability and Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The team reviewed licensee documentation to verify that at least one post-fire safe shutdown success path was free of fire damage in the event of a fire in the selected fire areas. Specifically, the team examined the separation of safe shutdown cables, equipment, and components within the same fire areas. Additionally, on a sample basis, the team reviewed the licensee's analysis of electrical protective devices (e.g., circuit breaker, fuse, relay), coordination, and the adequacy of electrical protection provided for nonessential cables which share a common enclosure (e.g., cable trays) with cables of equipment required to achieve and maintain safe shutdown conditions. A sample of fire barrier penetration seals in the selected fire areas was reviewed by the team. The team reviewed the licensee's methodology for meeting the requirements of 10 CFR 50.48, and the bases for the NRC's acceptance of this methodology as documented in NRC safety evaluation reports. In addition, the team reviewed license documentation, such as the Diablo Canyon Updated Safety Evaluation Report, submittals made to the NRC by the licensee in support of the NRC's review of their fire protection program, and deviations from NRC regulations to verify that the licensee met license commitments.

The team reviewed a comprehensive list of design changes that resulted in removal of Thermo-Lag fire barriers, focusing on instances where manual actions were substituted in lieu of installing another fire barrier.

b. Findings

b.1 Removal of Thermo-Lag Fire Barriers

Introduction: The team identified an unresolved item in which the licensee made changes to the fire protection program that could have the potential to adversely affect their ability to achieve and maintain safe shutdown. In particular, the licensee removed a Thermo-Lag fire barrier, and established manual actions to open component cooling water supply header motor-operated Valve FCV-431 if it spuriously operated as a result of fire damage. This item is unresolved pending receipt of additional information from the licensee concerning the methodology used for determining that Valve FCV-431 would not sustain damage to the extent that it would not be able to be manually operated.

Description: The team reviewed a comprehensive list of design changes that resulted in removal of Thermo-Lag fire barriers, focusing on instances where manual actions were established in lieu of providing the physical protection specified in Section III.G.2 of Appendix R to10 CFR Part 50. In Design Change DCP A-050070, "Replace Existing Thermo-Lag Fire Barriers Installed in Unit 2 with Alternative Systems," Revision 0, the licensee removed Thermo-Lag 3-hour rated fire barriers from conduits and junction boxes (located in Fire Area TB-7/ Fire Zone 19-A) that contained power and control circuits associated with component cooling water supply header (motor-operated) Valve FCV-431. In the event of a fire in Fire Area TB-7, the licensee credits manual actions to open Valve FCV 431 to establish component cooling water flow to vital pumps credited for safe shutdown, such as centrifugal charging pump lube oil /gear oil coolers, component cooling water pump lube oil coolers, safety injection pump lube oil coolers, and safety injection pump seal water coolers.

The design change stated that operator action could be taken to manually open Valve FCV-431 (using the local handwheel operator) in the event that it spuriously closed as a consequence of fire damage. The team reviewed circuits associated with this valve and determined that two hot shorts could cause the valve to close while bypassing the limit switch that would normally stop the motion of the actuator prior to motor stall. A stall event has the potential to damage a motor-operated valve to the extent that subsequent manual handwheel operation may not be possible.

The team reviewed Calculation J-042, "Motor-Operated Rotary Valve and Damper Torque Requirements and Capability," Revision 8, to identify whether Valve FCV-431 could experience a motor stall event and remain available for manual operations. The torque rating of the actuator is 250 foot-pounds, with a one-time overtorque allowable of two times this amount (500 foot-pounds) as specified by the manufacturer (Limitorque, Inc.). The calculation used a revised formula to estimate stall torque, using a pullout actuator efficiency in lieu of the stall actuator efficiency (which is normally used in stall calculations), while uprating motor torque by 20 percent. Using this formula, the licensee calculated the stall torque for Valve FCV-431 to be 467 foot-pounds, which was within the manufacturer's limit for a one-time event. Using the standard method for calculating stall, the team determined the stall torque to be 563 foot-pounds, which is in excess of the one-time allowable. Because the outcome depended on the validity of the

revised stall formula, the team requested that the license provide validation for its use. The licensee utilized this methodology for estimating stall torque for most of their motor-operated valves.

Following the onsite inspection, several conference calls were conducted to discuss the validity of the revised stall formula. The licensee stated that it relied on two pieces of information: (1) SEL-12, published by Limitorque; and (2) NUREG/CR-6478, "Motor-Operated Valve Actuator Motor and Gearbox Testing," dated July 1997. The SEL-12 provided a table that showed various configurations of actuator size and gear ratio that are “inherently protected” against stall events. Valve FCV-431 was indicated by this table to be stall protected. NUREG/CR-6478 documented results of tests conducted by the Idaho National Engineering and Environmental Laboratory (INEEL) that monitored actuator efficiencies under various service conditions.

Although SEL-12 is still endorsed by Limotorque, the team questioned its use, because it was published in 1980 and did not reflect the results of numerous testing programs conducted since that time. The team also questioned whether NUREG/CR-6478, which showed pullout efficiency to bound observed measurements during stall, could be used for Valve FCV-431, since the tested valve at INEEL was a flexible-wedge gate valve. Valve FCV-431 is a butterfly valve. The manner in which the valve is loaded prior to experiencing a stall is different in both cases and this difference can result in a different actuator efficiency. In response to this concern, the licensee staff agreed to analyze the loading behavior of Valve FCV-431 during a stall event and to make a comparison to the valve tested by INEEL. This issue is considered an unresolved item pending receipt and review of the licensee’s evaluation.

Analysis: The risk of this issue will be evaluated upon determination that Valve FCV-431 could sustain damage due to an overtorque event. This item is unresolved pending receipt of additional information from the licensee concerning the methodology used for determining that Valve FCV-431 would not sustain damage to the extent that it would not be able to be manually operated. The overtorque, even if it equaled 563 foot-pounds in accordance with the standard calculation, would have small probability of damaging the valve enough to affect manual operations.

Enforcement: Diablo Canyon Nuclear Power Plant, Unit 2, Docket 50-323, Facility Operating License, License Condition 2.C.4, states that the licensee may make changes to the approved fire protection program without prior approval of the Commission if those changes would not adversely affect their ability to achieve and maintain safe shutdown in the event of a fire. The licensee implemented a design change in which they substituted manual actions to close Valve FCV-431 in the event a fire in Fire Area TB-7 caused it to spuriously open. Whether this issue is a violation remains unresolved pending receipt of additional information from the licensee concerning the methodology used for determining that Valve FCV-431 would not sustain damage to the extent that it would not be able to be manually operated (URI 275;323/0302-01).

b.2 Manual Actions in Lieu of Physical Protection Requirements

Introduction: An unresolved item was identified concerning the use of manual actions in lieu of ensuring that one train of systems necessary to achieve and maintain hot shutdown conditions was free of fire damage, as required by 10 CFR Part 50, Appendix R, Section III.G.2. This issue is unresolved pending receipt and review of additional fire protection licensing basis information.

Description: In reviewing Calculation M-928 "10 CFR 50 Appendix R Safe Shutdown Analysis," the team found that in the event of a fire in numerous fire areas the licensee credited the use of manual actions in lieu of providing the physical protection specified in Section III.G.2 of Appendix R. Many of these manual actions were found to have been submitted to the NRC during review of the licensee's fire protection program. However, the team could not verify that all manual actions taken in lieu of providing the physical protection specified in 10 CFR Part 50, Appendix R, Section III.G.2, were submitted to the NRC. The licensee agreed to review their fire protection licensing basis documents and provide those that demonstrate all manual actions credited in lieu of physical separation had been submitted for NRC review. The team reviewed the manual actions credited in the event of a fire in the selected fire areas, and found that all were described in procedures and appeared to be reasonable and feasible. This issue is considered an unresolved item pending completion of the licensee's fire protection licensing basis review.

Analysis: The risk of this issue will be evaluated upon receipt and review of additional fire protection licensing basis documents that demonstrate all manual actions credited in lieu of physical separation had been submitted for NRC review. This item is unresolved pending receipt of additional information from the licensee concerning their fire protection licensing basis.

Enforcement: Diablo Canyon Nuclear Power Plant, Unit 1, Docket 50-275, Facility Operating License, License Condition 2.C.5.a and Diablo Canyon Nuclear Power Plant, Unit 2, Docket 50-323, Facility Operating License, License Condition 2.C.4.a., state that the licensee will implement and maintain in effect all provisions of the approved fire protection program. The licensee's fire protection program for both units is described in a number of licensing basis documents. The licensee has agreed to review their fire protection program licensing basis documents, and provide those which demonstrate that manual actions credited in lieu of the physical protection specified in Appendix R were submitted for NRC review. Whether this issue is a noncompliance remains unresolved pending receipt of this licensing basis information (URI 50-275; -323/0302-02).

.3 Alternative Safe Shutdown Capability and Implementation

a. Inspection Scope

The team reviewed the systems required to achieve alternative safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions from the remote

shutdown panel and alternate shutdown locations. The team focused on the adequacy of the systems to perform reactor pressure control, reactor makeup, decay heat removal, process monitoring, and support system functions. The team also reviewed Abnormal Operating Procedure OP AP-8A, "Control Room Inaccessibility - Establishing Hot Standby," Revision 13, which would be used by operators to shut down the reactor in the event of a control room fire that required evacuation and remote shutdown. The actions of licensed and non licensed personnel were timed as they stepped through the procedure to determine its adequacy of the procedure to direct safe shutdown from remote shutdown locations.

b. Findings

b.1 Timing of Operator Actions in Control Room Fire and Evacuation Scenario

Introduction: The team identified a finding which is a violation of Technical Specification 5.4.1.d, for failure to establish, implement, and maintain an adequate procedure covering fire protection program implementation. Specifically, in a control room fire scenario requiring control room evacuation and remote shutdown, operators failed to complete the actions specified in procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," within the times assumed in Calculation M-944 “10 CFR 50 Appendix R, Alternate Shutdown Methodology Time and Manpower Study/Safe Shutdown System Considerations.” This finding remains unresolved pending a review of its risk significance.

Description The licensee's safe shutdown analysis Calculation M-944 “10 CFR 50 Appendix R, Alternate Shutdown Methodology Time and Manpower Study/Safe Shutdown System Considerations,” credited operator action to mitigate the effects of a control room fire. The analysis assumed operator action to: (1) trip the reactor immediately; (2) close power operated relief valve(s) within 5 minutes; (3) trip charging pump(s) within 11 minutes; (4) initiate auxiliary feedwater within 30 minutes; (5) initiate auxiliary salt water within 72 minutes; and (6) trip pressurizer heaters within 2.5 hours. The analysis also credited non-time critical actions to align auxiliary feedwater to the raw water storage reservoir and trip a safety injection pump within 8 hours.

The team timed operator actions required to be performed within 30 minutes, assuming a fire in the control room requiring control room evacuation. The only action assumed to be taken in the control room was the reactor trip. These actions were simulated in the plant with no actual indications. The team found that the operators could take the power operated relief to the emergency close position within 5 minutes, as required by Calculation M-944. However, because routine reactor trip actions inside the control were not credited, operators took 48 minutes to initiate auxiliary feedwater. This was well outside the 30 minutes required in Calculation M-944. As a result of this finding, the licensee immediately initiated night orders to inform operators of the time critical actions required in a control room fire and evacuation scenario. In addition, the night orders emphasized the need to properly prioritize the time critical actions out of sequence. The team determined that the licensee's immediate actions were adequate to ensure that a current safety issue did not exist.

The licensee noted that specific indications at the hot shutdown panel were not available for use during the timing evolution, and believed that this resulted in a scenario artificiality that slowed the actual operator response. The licensee re-performed the scenario on April 4, 2003, using the hot shutdown panel simulator to allow the shift foreman indications to properly diagnose and react to the event. During the simulator run on the simulator alternative shutdown panel, operators took 18 minutes to close the power-operated relief valve and 42 minutes to initiate auxiliary feedwater (versus 5 minutes and 30 minutes assumed in Calculation M-944, respectively). The licensee initiated action request AR0580357 to place this item into the corrective action system.

Analysis: This finding was of greater than minor significance because it impacted the mitigating systems cornerstone and adversely affected the ability of the licensee to manually operate certain components required for safe shutdown within the analyzed times. Specifically, in a simulated field walkdown, operators were not able to establish auxiliary feedwater within 30 minutes as required by analysis.

Enforcement: Section 5.4.1.d, of the Diablo Canyon Nuclear Power Plant, Units 1 and 2 Technical Specifications, states that procedures shall be established, implemented, and maintained covering fire protection program implementation. Contrary to the above, in a control room fire scenario requiring control room evacuation and remote shutdown, the licensee failed to adequately implement fire protection program requirements. Specifically, operators failed to complete the actions specified in Procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," within the times assumed in Calculation M-944, “10 CFR 50 Appendix R, Alternate Shutdown Methodology Time and Manpower Study/Safe Shutdown System Considerations.” This is a violation of Technical Specifications Section 5.4.1.d. Pending determination of its safety significance, this violation is identified as unresolved item URI 50-275; -323/0302-03.

b.2 Lack of Guidance On Taking Local Control at the Hot Shutdown Panel

Introduction: The team identified another example of finding that is a violation of Technical Specification 5.4.1.d, for failure to establish, implement, and maintain an adequate procedure covering fire protection program implementation. Specifically, the licensee failed to provide adequate information in procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," concerning how to take local control of certain components required for safe shutdown. This finding remains unresolved pending a review of its risk significance.

Description: Procedure OP AP-8A directed operators to take control of certain components at the hot shutdown panel. On the Unit 2 hot shutdown panel, operators had two switch positions to choose from: "AUTO" or "MANUAL." The procedure failed to provide the operators with adequate direction concerning how to take control of these components at the hot shutdown panel. The team noted that operator aids which were provided on the Unit 1 hot shutdown panel were missing from the Unit 2 hot shutdown panel. The missing operator aids were those that identified that the "AUTO" position on the hot shutdown panel equated to control room operation and that the "MANUAL" position on the hot shutdown panel equated to local or hot shutdown panel control. The team noted that these missing operator aids impacted the crew's response to the fire

scenario, in that the operators did not take local control of several parameters during the scenario. Thus, the automatic controls for several parameters, such as auxiliary feedwater throttle valve positions and steam generator atmospheric dump valve positions would have remained in the control room positions, still exposed to fire damage and possible spurious operation.

With no procedural guidance concerning how to take local control, coupled with the fact that the operator aids were missing, the team concluded that Procedure OP AP-8A was not adequate to ensure operators could take local control of certain components required for safe shutdown. The licensee initiated action request AR 0573063 to replace the missing operator aids for Valves PCV-19, PCV-20, PCV-21, PCV-22, HCV-142, and FCV-128. The operator aids were reinstalled on February 4, 2003; therefore, no safety issue existed at the conclusion of the inspection.

Analysis: This finding was of greater than minor significance because it impacted the mitigating systems cornerstone and adversely affected the ability of the licensee to take control of certain components required for safe shutdown. Specifically, operator aids identifying the correct panel switch positions for the auxiliary feedwater throttle valves and steam generator atmospheric dump valves were missing from the Unit 2 hot shutdown panel. During a control room fire and remote shutdown, if not placed in the correct positions, these components would have remained vulnerable to fire damage that could cause spurious operation.

Enforcement: Section 5.4.1.d, of the Diablo Canyon Nuclear Power Plant, Units 1 and 2 Technical Specifications, states that procedures shall be established, implemented, and maintained covering fire protection program implementation. Contrary to the above, in a control room fire scenario requiring control room evacuation and remote shutdown, the licensee failed to adequately implement fire protection program requirements. Specifically, the licensee failed to provide adequate information in Procedure OP AP-8A, "Control Room Inaccessibility Hot Standby," concerning how to take local control of certain components required for safe shutdown. Consequently, in stepping through Procedure OP AP-8A, operators failed to transfer control of certain safe shutdown components from the control room to the hot shutdown panel. This is a violation of Technical Specifications Section 5.4.1.d. Pending determination of its safety significance, this violation is identified as a second example of unresolved item URI 50-275; -323/0302-03.

.4 Emergency Communications

a. Inspection Scope

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties. The team verified that adequate communication equipment was available consistent with the licensing basis.

b. Findings

No findings of significance were identified.

.5 Emergency Lighting

a. Inspection Scope

The team reviewed the emergency lighting system to verify that it was adequate for supporting the performance of manual actions required to achieve and maintain hot shutdown conditions, and for illuminating access and egress routes to the areas where manual actions are required.

b. Findings

No findings of significance were identified.

.6 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the licensee's methodology for performing cold shutdown repairs, to determine whether repairs were required to achieve cold shutdown and to verify that the required material was available.

b. Findings

No findings of significance were identified.

.7 Fire Protection Systems, Features, and Equipment

a. For the selected fire areas, the team evaluated the adequacy of fire protection features, such as fire suppression and detection systems, fire area barriers, penetration seals, and fire doors. To do this, the team observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as NRC safety evaluation reports and deviations from NRC regulations and the National Fire Protection Association code to verify that fire protection features met license commitments.

b. Findings

No findings of significance were identified.

.8 Compensatory Measures

a. Inspection Scope

The team verified, by sampling, that adequate compensatory measures were put in place by the licensee for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems or features (e.g., detection and suppression systems, or passive fire barrier features).

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On, January 30, 2003, at the conclusion of the onsite portion of this inspection, the team leader debriefed Messrs. S. Chesnut, Director, Engineering Services, Bob Waltos, Director, Outage Management, and other licensee staff members on the preliminary inspection results.

On March 18, 2003, the team leader conducted a telephone exit meeting with Messrs. J. Becker, Vice President, Diablo Canyon Power Plant and Station Director, L. Womack, Vice President, Nuclear Services, and other licensee staff members, during which the results of this inspection were characterized.

The licensee was asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

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D. Cherington, Nuclear Operator
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P. Qualls, NRC Office of Nuclear Reactor Regulation
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ITEMS OPENED AND CLOSED

Items Opened

50-275;323/0302-01	URI	The licensee made a change to its fire protection program without NRC approval, which may have adversely affected its ability to achieve and maintain safe shutdown conditions. In particular, the licensee removed Thermo-Lag fire barriers and credited manual actions in their stead. This issue is unresolved pending additional information from the licensee concerning their methodology for determining stall torque. (Section 1R05.2.b.1)
50-275;323/0302-02	URI	For a fire in some fire areas, the licensee credited manual actions to mitigate the consequences of a fire, in lieu of ensuring one train of equipment and cabling associated with systems required for safe shutdown was free of fire damage, as required by 10 CFR Part 50, Appendix R, Section III.G.2. This issue is unresolved pending additional licensing basis information (Section 1R05.2.b.2)

50-275;323/0302-03	URI	Two examples of a violation of Technical Specification 5.4.1.d for inadequate fire protection implementation procedure, OP-8A. This violation is unresolved pending a risk determination. (Sections 1R05.3.b.1 and 1RO5.3.b.2)

DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Action Requests

0468379
0503978
0565815
0571736
0572712
0573063
0573177
0580357

Calculations:

J-042, “Motor Operated Rotary Valve and Damper Torque Requirements and Capability,” Revision 8

M-680, “10 CFR 50 Appendix B Safe Shutdown Equipment,” Revision 14

M-928, “10 CFR 50, Appendix R Safe Shutdown Analysis,” Revision 10

M-944, “10 CFR 50 Appendix R, Alternate Shutdown Methodology Time and Manpower Study/Safe Shutdown System Considerations," Revision 1

M-997, "Fire Barrier Penetration Seals", Design Detail 066689, Revision 12

134-DC, " Electrical Appendix R Analysis: Attachment 2, Appendix R Blocked Conduits," Revision 6

234B-DC, "125V DC Battery 12- Coordination Evaluation," Revision 4

202-DC, "System Coordination Study for Class 1E 480V Buses," Revision 1

Design Changes:

DCP A-050070, “Replace Existing Thermo-Lag Fire Barriers Installed in Unit 2 with Alternative Systems,” Revision 0

Drawings:

065126, Section 32, Pages 161, 162, 163, 164,165, 166, 179, 180, 181, and 182, "FireZones - IDS - Circuits - Locations - Raceways," Revision 12

067997, "DCPP Unit 1 SRData Raceway Report," Revision 7

102003, Sheet 4, “Feedwater System,” Revision 66

102008, Sheet 4B, "CVCS System,” Revision 109

102032, Sheet 26J, Revision 11

106707, Sheet 3, Revision 45

106708, Sheet 3, Revision 68

109808, Sheet 3, Revision 1

109808, Sheet 48 "Charge to Pzr Aux Spray Vlv 8145," Revision 4

437518, "Single Line Diagram for Station Auxiliaries," Revision 35

437542, " Single Line Meter and Relay Diagram 480 Volt System Bus Section 1G," Revision 45

437543, " Single Line Meter and Relay Diagram 480 Volt System Bus Section 1H," Revision 41

437587, "Schematic Diagram Reactor Coolant Motor Operated Valves," Change19

437608, "Schematic Diagram Component Cooling Water System Motor Operated Valves," Revision 20

437609, "Schematic Diagram Reactor Coolant System Solenoid Valves," Revision 15

437648, "Steam Dump Solenoid Valves & System," Revision 11

437649, "Steam Dump Solenoid Valves & System," Revision 9

437682, "Schematic Diagram Chemical & Volume Control System Solenoid Valves," Revision 21

437683, "Schematic Diagram Chemical & Volume Control System Solenoid Valves," Revision 22

437681, "Schematic Diagram Component Cooling Water Solenoid Valves," Revision 18

437916, " Single Line Meter and Relay Diagram 480 Volt System Bus Section 1F," Revision 40

445075, "Single Line Meter and Relay Diagram 125 volt DC System," Revision 15

491716, "Hot Shutdown Panel Arrangement Drawing," Revision 3

502110, "Single Line Diagram 500/230/12/4.16 KV Systems, Revision 12

521121, "Main Control Room Vertical Board VB-1," Revision 6

521122, "Main Control Room Vertical Board VB-2 Arrangement," Revision 8

521123, "Main Control Room Vertical Board VB-3 Arrangement," Revision 3

521124, "Main Control Room Vertical Board VB-4 Arrangement," Revision 11

521125, "Main Control Room Vertical Board VB-5 Arrangement," Revision 3

Procedures:

OP AP-8A, "Control Room Inaccessibility Hot Standby," Revision 13A
OP AP-8B, "Control Room Inaccessibility-Hot Standby to Cold Shutdown," Revision 9
CP M-10, "Fire Protection of Safe Shutdown (SSD) Equipment," Revision 15

Safety Evaluation Reports

NUREG 0675, Supplement No. 8, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated June 1980

NUREG 0675, Supplement No. 9, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated November 1978

NUREG 0675, Supplement No.13, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated April 1981

NUREG 0675, Supplement No. 23, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated June 1984

NUREG 0675, Supplement No. 27, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated July 1984

NUREG 0675, Supplement No. 31, "Safety Evaluation Report related to the operation of Diablo Canyon Nuclear Power Station, Units 1 and 2," dated April 1985

Miscellaneous:

Diablo Canyon Units 1 and 2 Supplementary Information for Fire Protection Review, revised November 13, 1978.

Diablo Canyon Final Safety Analysis Report Update, Appendix 9.5, Revision **???**

Letter dated December 6, 1984, Pacific Gas and Electric Company to NRC, ”Diablo Canyon Unit 2, Fire Protection Review for Conformance to 10 CFR 50, Appendix R"

Letter dated September 28, 1992, Pacific Gas and Electric to NRC, “Response to Supplement 1 of NRC Bulletin 92-01"

Letter dated October 27, 1992, NRC to Pacific Gas and Electric, “Review of Response to NRC Bulletin 92-01, Supplement 1, Failure of Thermo-Lag 330 Fire Barrier System to Perform its Specified Fire Endurance Function- Diablo Canyon Nuclear Power Plant, Units 1 and 2"

Letter dated December 17, 1992, NRC to Pacific Gas and Electric,”Thermo-Lag 330-1 Fire Barriers (Generic Letter 92-08)”

Letter dated April 16, 1993, “Pacific Gas and Electric to NRC, “Response to NRC Generic Letter 92-08"

Letter dated April 30, 1993, Pacific Gas and Electric to NRC, “Information Related to Response to Supplement 1 of Bulletin 92-01"

Letter dated June 22, 1993, NRC to Pacific Gas and Electric, “Response to Generic Letter 92-08"

Letter dated December 21, 1993, NRC to Pacific Gas and Electric, “Request for Additional Information Regarding Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers, Pursuant to 10 CFR 50 - Diablo Canyon, Units 1 and 2"

Letter dated February 14, 1994, Pacific Gas and Electric to NRC, “Response to Request for Additional Information Regarding Generic Letter 92-08"

Letter dated January 12, 1995, Pacific Gas and Electric, “Completion of Thermo-Lag Replacement”

Letter dated May 24, 1996, Pacific Gas and Electric Company to NRC, ”Engineering Calculation for Emergency Lighting and Communications"

Letter dated August 8, 1996, Pacific Gas and Electric Company to NRC, ”Transmittal PG&E Engineering Calculations"

Letter dated February 7, 1997, Pacific Gas and Electric Company to NRC, ”Response to Request for Information Concerning Diablo Canyon Engineering Calculation for Emergency Lighting and Communications"

Letter dated April 4, 1997, NRC to Pacific Gas and Electric Company, "Review of Diablo Canyon Engineering Calculation for Emergency Lighting and Communications (TAC Nos. M92632 and M92633)"

Memorandum dated August 11, 1993, NES Nuclear Engineering, “Fire Protection Study for Pressurizer PORV Stuck Open Verified per Engineering Procedure 3.3"

NUREG/CR-6478, Motor-Operated Valve Actuator Motor and Gearbox Testing," July 1997.

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