



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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September 10, 2009

John T. Conway  
Senior Vice President &  
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Pacific Gas and Electric Company  
P.O. Box 3  
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Avila Beach, CA 93424

SUBJECT: DIABLO CANYON POWER PLANT, UNITS 1 AND 2 - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000275/2009008; 05000323/2009008

Dear Mr. Conway:

On July 23, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Diablo Canyon Power Plant. The enclosed inspection report documents the inspection results, which were discussed in an exit meeting with Mr. James R. Becker, Site Vice President, and other members of your staff.

The 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. The team reviewed selected procedures and records, observed activities, and interviewed personnel.

The inspection identified one violation of very low safety significance (Green). However, because of the very low safety significance and because the finding was entered into your corrective action program, the NRC is treating this finding as a noncited violation consistent with the NRC Enforcement Policy. If you contest the noncited violation in this report, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Senior Resident Inspector at the Diablo Canyon Power Plant facility.

In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the Diablo Canyon Power Plant facility. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Neil O'Keefe, Chief  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: NRC Inspection Report 05000275/2009008; 05000323/2009008  
w/Attachment: Supplemental Information

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**ENCLOSURE**

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Dockets: 50-275; 50-323

Licenses: DPR-80; DPR-82

Report: 05000275/2009008; 05000323/2009008

Licensee: Pacific Gas and Electric Company

Facility: Diablo Canyon Power Plant, Units 1 and 2

Location: 7 ½ miles NW of Avila Beach  
Avila Beach, California

Dates: July 6 through July 23, 2009

Inspectors: J. Mateychick, Senior Reactor Inspector  
S. Graves, Senior Reactor Inspector  
R. Rodriguez, Senior Reactor Inspector  
D. Livermore, Nuclear Systems Engineer

Accompanying Personnel: Z. Bailey, Reactor Inspector NSPDP  
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Approved By: Neil O'Keefe, Chief  
Engineering Branch 2  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000275/2009008; 05000323/2009008; 07/06/2009 - 07/23/2009; Pacific Gas and Electric Company; Diablo Canyon Power Plant, Units 1 and 2; Triennial Fire Protection Team Inspection

The report covered a 2-week triennial fire protection team inspection. One Green noncited violation was identified. 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 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

Green. An NRC-identified noncited violation of License Condition 2.C.(4), "Fire Protection," was identified in that post-fire safe shutdown Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 20, was not consistent with the calculation M-928, "10 CFR 50 Appendix R Safe Shutdown Analysis," for Fire Area 3-CC, containment penetration rooms. Specifically, certain time-critical operator manual actions identified in the safe shutdown analysis were not incorporated into Procedure CP M-10 such that there was assurance that the actions would be completed within the times assumed in the safe shutdown analysis. A fire in Fire Area 3-CC may cause a spurious actuation of Atmospheric Dump Valves PCV-19 and PCV-20. The safe shutdown analysis recommends failing closed Atmospheric Dump Valves PCV-19 and PCV-20 by manually isolating their air supply (instrument air, backup air, and nitrogen) and then venting the supply line to avoid excessive plant cooldown. Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 20, did not include the steps to perform these actions.

The inspectors determined that failing to incorporate post-fire safe shutdown actions to prevent an excessive cooldown due to fire induced spurious opening of atmospheric dump valves in the post-fire safe shutdown operating procedure was a performance deficiency. This finding is more than minor because it is associated with the reactor safety mitigating systems cornerstone attributes of protection against external events, (i.e., fire), and procedure quality. This finding was found to be of very low safety significance (Green) consistent with the guidance in Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," and its attachments. This finding has a crosscutting aspect in the Resources component of the Human Performance area because the procedure was not complete and up to date in accordance with the safe shutdown analysis, H.2(c).

### B. Licensee-Identified Violations

None

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

##### 1R05 Fire Protection (71111.05TTP)

The NRC conducted a triennial fire protection inspection in accordance with NRC Inspection Procedure 71111.05TTP, "Fire Protection-NFPA Transition Period (Triennial)," at the Diablo Canyon Power Plant. The licensee committed to adopt a risk informed fire protection program in accordance with National Fire Protection Association (NFPA) 805, "Performance Based Standard for Fire Protection for Light Water Reactor Generating Plants," 2001 Edition. At the time of this inspection, the licensee had not yet completed the program transition. The inspection team evaluated the implementation of the approved fire protection program in selected risk-significant areas, with an emphasis on the procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shut down the plant.

Inspection Procedure 71111.05TTP requires the selection of three to five fire areas for review. The inspection team used the fire hazards analysis and the Diablo Canyon Power Plant Individual Plant Examination of External Events to select the following four fire areas in Unit 2 for review:

- Fire Area 3-CC, Containment Penetration Rooms (all levels)
- Fire Area 7B, Cable Spreading Room
- Fire Area 20, 12 kV Switchgear and Cable Spreading Room
- Fire Area TB-10, (Turbine Building) Fire Zone 23-A, F Bus 4 kV Cable Spreading Room
- Fire Area TB-10, Fire Zone 24-A, F Bus 4 kV Switchgear Room

The team evaluated the licensee's fire protection program using applicable requirements, which included plant Technical Specifications, License Condition 2.C.(4), NRC safety evaluations, 10 CFR 50.48, and Branch Technical Position 9.5-1. The team also reviewed related documents that included the Final Safety Analysis Report, the fire hazards analysis, and the post-fire safe shutdown analysis.

Specific documents reviewed by the team are listed in the attachment. The team completed four inspection samples.

.1 Shutdown From Outside Main Control Room

a. Inspection Scope

The team reviewed the post-fire safe shutdown analysis in calculation M-928, “10 CFR 50 Appendix R Safe Shutdown Analysis,” Operating Procedures OP AP-8A “Control Room Inaccessibility – Establishing Hot Standby,” and OP AP-8B “Control Room Inaccessibility – Hot Standby to Cold Shutdown,” piping and instrumentation drawings, electrical drawings, the Final Safety Analysis Report, and other supporting documents to verify that hot and cold shutdown conditions could be achieved and maintained for fires in areas where the post-fire safe shutdown strategy relies upon manipulating shutdown equipment after evacuation of the control room.

The team focused on the following functions that must be available to achieve and maintain 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 other services necessary to permit extended operation of equipment necessary to achieve and maintain hot shutdown conditions,
- Verify that a safe shutdown can be achieved and maintained with and without off-site power.

The team verified that hot and cold shutdown conditions could be achieved and maintained with or without offsite power available. The team also verified that the post-fire safe shutdown analysis properly identified the components and systems needed to achieve and maintain post-fire safe shutdown conditions.

b. Findings

No findings of significance were identified.

.2 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed local operator manual actions to ensure that the actions could be implemented in accordance with plant procedures in the times necessary to support the post-fire safe shutdown method for the applicable fire area and to verify that those actions met the criteria in Enclosure 2 of NRC Inspection Procedure 71111.05TTP. Specifically, the team reviewed and walked down applicable sections of fire response procedure CP M-10, “Fire Protection of Safe Shutdown Equipment,” Revision 20, for Fire Areas 3-CC (all levels), 20, and TB-10 to ensure the implementation and human factors adequacy of the procedure.



The inspectors reviewed cable routing data for a sample of safe shutdown components that had associated cables routed through the selected fire areas. The inspectors reviewed the electrical schematics and connection wiring diagrams to determine if the operator manual actions credited in Procedure CP M-10 for those components were adequate. The components and documents reviewed are listed in the Attachment.

The team also reviewed corrective action documents Action Request A0645338, "NRC URI on Manual Actions," and A0620761, "Manual Actions – Substantive with Documentation," to verify that the licensee had identified operator manual actions for post-fire safe shutdown in 10 CFR 50, Appendix R, Section III.G.2 designated areas and had plans in place to keep Action Requests open to assess and track resolution of the manual action issue as part of the plant-wide risk evaluation for transition to NFPA 805.

b. Findings

Safe Shutdown Procedure Not Consistent With Safe Shutdown Analysis

Introduction. The team identified a violation of License Condition 2.C.(4), in that post-fire safe shutdown Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 20, was not consistent with the Calculation M-928, "10 CFR 50 Appendix R, Safe Shutdown Analysis," for Fire Area 3-CC, containment penetration rooms. Specifically, certain time-critical operator manual actions stated in the safe shutdown analysis were not incorporated into Procedure CP M-10 such that there was assurance that the actions would be completed within the times assumed in the safe shutdown analysis.

Description. The team reviewed applicable sections of fire response Procedure CP M-10 to assess the procedural guidance for operation from the Main Control Room in the event of a fire in Fire Area 3-CC. As part of Diablo Canyon Power Plant transition to NFPA 805, the licensee credited several operator manual actions as compensatory measures for missing or degraded fire barriers. These operator manual actions will remain in place until they have been evaluated as part of the NFPA 805 transition. During review and walk down of Procedure CP M-10, the team noted that time critical operator manual actions specified in the safe shutdown analysis to locally fail close Atmospheric Dump Valves PCV-19 and PCV-20 were not incorporated into Procedure CP M-10.

A fire in Fire Area 3-CC may affect control cables, which can cause a spurious opening of Atmospheric Dump Valves PCV-19 and PCV-20. The safe shutdown analysis recommends failing closed valves PCV-19 and PCV-20 by manually isolating their air supply (instrument air, backup air, and nitrogen) and then venting the supply line to avoid excessive plant cooldown. This was a time-critical operator action because spurious opening of these valves could lead to the pressurizer level decreasing off scale low within 30 minutes. The team determined that lack of guidance could lead to an uncontrolled cooldown of the reactor coolant system which would complicate the shutdown evolution. Upon discovery of this procedural deficiency, the licensee initiated Notification SAPN 50253971 and revised Procedure CP M-10 to add the operator action.

Analysis. The inspectors determined that failing to incorporate post-fire safe shutdown actions to prevent an excessive cooldown due to fire induced spurious opening of

atmospheric dump valves in the post-fire safe shutdown operating procedure was a performance deficiency. This finding is more than minor because it is associated with the reactor safety mitigating systems cornerstone attributes of protection against external events, (i.e., fire), and procedure quality. The team determined that although Procedure CP M-10 did not incorporate the operator action specified in the safe shutdown analysis, it was likely that the operator would have recognized the need for the actions. Additionally, there was a low likelihood of fires which could cause the type of cable damage that would challenge the procedure weaknesses. Fire Area 3-CC is the electrical and mechanical penetration area for the Unit 2 containment and contains very low combustible materials and very few fixed ignition sources. Transient combustibles are strictly controlled as well. In consideration of the above, the finding was found to be of very low safety significance (Green) consistent with the guidance in Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," and its attachments. This finding has a crosscutting aspect in the Resources component of the Human Performance area because the procedure was not complete and up to date in accordance with the safe shutdown analysis [H.2(c)].

Because the licensee committed to adopting NFPA 805 and are changing their Fire Protection Program license basis to comply with 10 CFR 50.48.(c), these manual actions were to remain in effect as compensatory measures until the issue was resolved and compliance restored. Calculation M-928, "10 CFR 50 Appendix R Safe Shutdown Analysis," Revision 16, lists the manual actions credited on a fire area basis to compensate for component and cable losses.

Enforcement. Diablo Canyon License Condition 2.C (4) requires that the licensee shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in Revision 5 to the Final Safety Analysis Report Update, in Pacific Gas and Electric Company's December 6, 1984, Appendix R Analysis Report, and in the NRC staff's Fire Protection Evaluation in Safety Evaluation Reports Supplements 8, 9, 13, 23, and 27 to the Diablo Canyon Safety Evaluation Report. Final Safety Analysis Report Update, Appendix 9.5A, "Fire Hazards Analysis," states that the plant can be safely shutdown in the event of a fire in Fire Area 3-CC and states that operators may fail close Atmospheric Pump Valves PCV-19 and PCV-20 using manual actions. The Calculation M-928, "10 CFR 50 Appendix R Safe Shutdown Analysis," section for Fire Area 3-CC, containment penetration rooms, specified that Atmospheric Dump Valves PCV-19 and PCV-20 be failed closed to mitigate spurious opening.

Contrary to the above, Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 20, did not include the operator manual actions specified in Calculation M-928 to locally fail close Atmospheric Dump Valves PCV-19 and PCV-20. This condition has existed since at least October 14, 2008, when Procedure CP M-10, Revision 20, was issued. Although the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is not exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, this issue would have been expected to be identified and addressed by routine licensee quality assurance activities associated with correcting the susceptibility to excessive cooldown due to fire damage. Because this finding is of very low safety significance and was entered into the licensee's corrective action program (SAPN 50253971), this finding is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC's

Enforcement Policy. NCV 05000275/2009008-01, "Safe Shutdown Procedure Not Consistent With Safe Shutdown Analysis."

.3 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe the material condition and configuration of the installed fire area boundaries (including walls, fire doors, and fire dampers) and verify that the fire barriers were appropriate for the fire hazards in the area. The team compared the installed configurations to the approved construction details, supporting fire tests, and applicable license commitments.

The team reviewed installation, repair, and qualification records for a sample of penetration seals to ensure the fill material possessed an appropriate fire rating and that the installation met the engineering design. The team also reviewed similar records for the rated fire wraps to ensure the material possessed an appropriate fire rating and that the installation met the engineering design.

The team reviewed license basis documentation, such as NRC safety evaluation reports and deviations from NRC regulations and the National Fire Protection Association codes, to verify that fire protection features met license commitments.

b. Findings

No findings of significance were identified.

.4 Active Fire Protection

a. Inspection Scope

**Fire Detection and Suppression**

For the selected fire areas, the team evaluated the adequacy of fire suppression and detection systems. The team reviewed the material condition, operational configuration, and design of the installed fire detection and suppression systems and compared it to licensing basis documentation and deviations from NRC regulations to verify that fire suppression and detection systems met license commitments. The team verified that the licensee had installed, tested, and maintained the automatic and manual suppression and detection systems in accordance with the National Fire Protection Association codes of record.

The team performed a walk down of accessible portions of the fire detection and suppression systems in the selected fire areas. The team also performed a walk down of major system support equipment in other areas (e.g., fire pumps) to assess the material condition of these systems and components. The team reviewed the fire pump 0-1 and 0-2 flow and pressure tests to verify that the pumps met their design requirements.

## **Fire Brigade**

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if licensee had provided sufficient information to fire brigade members and plant operators to identify post-fire safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected fire brigade equipment to determine operational readiness for fire fighting.

The team observed an unannounced fire drill, conducted on July 9, 2009, and the subsequent drill critique using the guidance contained in Inspection Procedure 71111.05AQ, "Fire Protection Annual/Quarterly." The team observed fire brigade members fight a simulated fire in Fire Area TB-10, Fire Zone 24-A, F Bus 4 kV Switchgear Room, located in the Turbine Building. The team verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions. The team evaluated the following specific attributes: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment taken to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

### b, Findings

No findings of significance were identified.

## .5 Protection from Damage from Fire Suppression Activities

### a. Inspection Scope

The team performed plant walk downs and document reviews to verify that redundant trains of systems required for hot shutdown, which are located in the same fire area, would not be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat, or hot gases, cause activation of suppression systems that could potentially damage all redundant post-fire safe shutdown trains.
- A fire in one of the selected fire areas or the inadvertent actuation or rupture of a fire suppression system would not directly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train).
- Adequate drainage is provided in areas protected by water suppression systems.

### b. Findings

No findings of significance were identified.

.6 Alternative Shutdown Capability

a. Inspection Scope

**Review of Methodology**

The team reviewed the post-fire safe shutdown analysis, operating procedures, piping and instrumentation drawings, electrical drawings, the Final Safety Analysis Report, and other supporting documents. The team reviewed these documents to determine whether hot and cold shutdown could be achieved and maintained from outside the control room for fires that require evacuation of the control room, with or without offsite power available.

The team conducted plant walk downs to verify that the plant configuration remained consistent with the description contained in the post-fire safe shutdown and fire hazards analyses. The team focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions.

The team also verified that the systems and components credited for post-fire safe shutdown would remain free from fire damage. Finally, the team verified that the transfer of control from the control room to the alternative shutdown location would not be affected by fire-induced circuit faults.

**Review of Operational Implementation**

The team verified that the licensed and non-licensed operators received training on alternative shutdown procedures. The team also verified that sufficient personnel to perform post-fire safe shutdown actions are trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team performed a timed walkthrough of the post-fire safe shutdown procedure with licensed and non-licensed operators to determine the adequacy of the procedure and to evaluate their ability to implement the procedure. The team evaluated whether the operators could be reasonably expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time-critical actions were verified including restoring electrical power, establishing control at the remote shutdown and local shutdown panels, establishing reactor coolant makeup, and establishing decay heat removal.

The team reviewed the time-critical manual actions identified by the licensee needed to support alternate shutdown from outside the control room, including calculation M-944, "10 CFR 50 Appendix R Alternate Shutdown Methodology – Time and Manpower Study/Safe Shutdown System Considerations," Revision 4, that provided the bases for these critical times. The review compared the simulated completion times recorded during the procedure walk through to the analytical values to verify that the operators could implement the procedure as intended.

The team also reviewed the operability and periodic testing of the alternative shutdown transfer capability, instrumentation, and control functions. The team selected a

centrifugal charging pump circuit for in-depth review of the isolation capability from outside the control room. This review included circuit review, isolation device coordination and functionality, and reviews of surveillance tests demonstrating the isolation capability of the control circuits to verify that the tests are adequate to demonstrate the functionality of the alternative shutdown capability.

b. Findings

No findings of significance were identified.

.7 Circuit Analysis

This segment of the inspection is suspended for plants in transition to a risk-informed fire protection program in accordance with National Fire Protection Association 805. Therefore, the team did not evaluate this area.

.8 Communications

a. Inspection Scope

The team inspected the contents of designated emergency storage lockers and reviewed the alternative shutdown procedure to verify that portable radio communications and fixed emergency communications systems remained available, operable, and adequate for the performance of designated activities. The team verified the capability of the communication systems to support the operators in the conduct and coordination of their required actions. The team also verified that the design and location of communications equipment such as repeaters and transmitters would not cause a loss of communications during a fire. The team discussed system design, testing, and maintenance with engineering personnel.

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative post-fire safe shutdown functions and fire brigade duties. The review verified that the licensee established and maintained in working order primary and backup communications and that communication equipment necessary for alternate safe shutdown support was properly categorized in the corrective action program. Further, the team evaluated the environmental impacts such as ambient noise levels, coverage patterns, and clarity of reception. The team verified that the electrical power supplies and cable routing for the phone system would allow them to remain functional following a fire in the control room and other fire areas.

b. Findings

No findings of significance were identified.

.9 Emergency Lighting

a. Inspection Scope

The team reviewed the portion of the emergency lighting system required for alternative shutdown to verify that it was adequate to support the performance of manual actions required to achieve and maintain hot shutdown conditions and to illuminate access and

egress routes to the areas where manual actions would be required. The team evaluated the locations and positioning of the emergency lights during a walkthrough of the alternative shutdown procedure.

The team verified that the licensee installed emergency lights with an 8-hour capacity, maintained the emergency battery-operated lights in accordance with manufacturer and industry recommendations, and tested and performed maintenance in accordance with plant procedures and industry practices. The team also reviewed the location of the emergency lights for a sample of areas to determine the adequacy of emergency lighting during control room evacuation events.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee identified repairs needed to reach and maintain cold shutdown and had dedicated repair procedures, equipment, and materials to accomplish these repairs. Using these procedures, the team evaluated whether these components could be repaired in time to bring the plant to cold shutdown within the time frames specified in their design and licensing bases. The team verified that the repair equipment, components, tools, and materials needed for the repairs were available and accessible on site.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

**Out-of-Service Equipment**

The team verified that compensatory measures were implemented for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems and equipment; passive fire barriers; or pumps, valves, or electrical devices providing post-fire safe shutdown functions). The team also verified that the short-term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

**Manual Actions**

The licensee has committed to transition to National Fire Protection Association 805, 2001 Edition, in accordance 10 CFR 50.48(c). The post-fire safe shutdown methodology includes the use of operator manual actions in place of

compliance with the requirements of 10 CFR Part 50, Appendix R, Section III.G.2. Section III.G.2 establishes a combination of physical barriers, spatial separation, fire detection and automatic suppression systems to protect redundant trains of post-fire safe shutdown equipment located within the same fire area. The licensee implemented operator manual actions because of their failure to comply with the requirements described in Section III.G.2 (This is discussed in NRC Inspection Report 05000275/2006009; 05000373/2006009). During the period of reanalysis and transition to a fire protection program based on National Fire Protection Association 805, manual actions may be acceptable as compensatory measures if they are feasible and reliable.

The team reviewed the licensee's treatment of operator manual actions as compensatory measures because of their commitment to adopt National Fire Protection Association (NFPA) 805. These manual actions were to remain in effect as compensatory measures until the issue was resolved and compliance restored or until they have been evaluated acceptable as part of the NFPA 805 transition.

b. Findings

See Section 1R05.02 of this report for a finding associated with compensatory actions. No other findings of significance were identified.

**4. OTHER ACTIVITIES [OA]**

4OA2 Identification and Resolution of Problems

Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team selected a sample of condition reports associated with the fire protection program to verify that the licensee had an appropriate threshold for identifying deficiencies. In addition, the team reviewed the corrective actions proposed and implemented to verify that they were effective in correcting identified deficiencies.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

The team presented the inspection results to Mr. James R. Becker, Site Vice President, and other members of the licensee staff at an exit meeting on July 23, 2009. The licensee acknowledged the findings presented. The team confirmed that they returned all proprietary information reviewed during this inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

J. Bailey, Supervisor, Engineering  
S. Baker, NFPA 805 Project Manager  
J. Becker, Site Vice President  
T. Bennett, Manager, Outage Scheduling  
T. Chitwood, Shift Manager, Operations  
G. Corsiglia, Lighting Systems Engineer  
F. dePeralta-Meister, Fire Protection Consultant  
S. Dunlap, Supervisor, Engineering  
S. Ellis, Fire Captain  
J. Fields, Auditor, Quality Assurance  
M. Ginn, Manager, Emergency Planning  
J. Gregerson, Fire Protection Consultant  
W. Guldemon, Director, Site Services  
D. Hampshire, Superintendent, Fire Protection  
C. Harbor, Maintenance Director  
S. Hamilton, Supervisor, Regulatory Services  
J. Haynes, Supervisor, Operations  
D. Hromyak, Fire Protection System Engineer  
P. Johnson, Supervisor, Electrical Design Engineering  
K. Johnston, Performance Manager, Operations  
S. Ketelsen, Manager, Regulatory Services  
T. King, Director, Outage Management  
M. McCoy, Engineer, Regulatory Services  
C. Paris, Fire Chief  
L. Parker, Acting Manager, Regulatory Services  
D. Peterson, Director, Quality Verification  
K. Peters, Station Director  
D. Powell, Systems Engineer  
M. Sharp, Supervisor, Balance of Plant Engineering  
H. Singh, Senior Engineer, Electrical Design Engineering  
B. Waggener, Fire Protection Engineer  
S. Westcolt, Director, Engineering  
M. Wright, Manager, Mechanical Engineering

#### NRC Personnel

M. Peck, Senior Resident Inspector  
T. Brown, Resident Inspector

## ITEMS OPENED AND CLOSED

### Opened and Closed

05000275/2009008-01      NCV      Safe Shutdown Procedure Not Consistent With Safe Shutdown Analysis (1R05.02)

## LIST OF DOCUMENTS REVIEWED

### Section 1R05.02.a: List of SSD Components Examined for Cable Routing

#### VALVES

8107, Charging Line Isolation Valve 1  
8108, Charging Line Isolation Valve 2  
8805A, Refueling Water Supply Valve  
8805B, Refueling Water Supply Valve  
FCV-41, Main Steam Isolation Valve Lead 1  
FCV-42, Main Steam Isolation Valve Lead 2  
FCV-43, Main Steam Isolation Valve Lead 3  
FCV-44, Main Steam Isolation Valve Lead 4  
FCV-510, Main Feedwater Control Valve for SG 2-1  
FCV-520, Main Feedwater Control Valve for SG 2-2  
FCV-530, Main Feedwater Control Valve for SG 2-3  
FCV-540, Main Feedwater Control Valve for SG 2-4  
FCV-95, Auxiliary Feedwater Pump 2-1 Turbine Main Steam Isolation Valve  
HCV-142, Primary and RCP Seal Charging Flow Control Valve  
LCV-112B, Volume Control Tank Outlet Valve  
LCV-112C, Volume Control tank Outlet Valve  
PCV-19, SG 2-1 10% Atmospheric Dump Valve  
PCV-20, SG 2-2 10% Atmospheric Dump Valve  
PCV-455A, Pressurizer Spray Valve  
PCV-455B, Pressurizer Spray Valve

#### INSTRUMENTS

LT-459, Pressurizer Level  
LT-461, Pressurizer Level  
PT-405, Hot Leg 3 Pressure  
PT-406, Hot Leg 4 Pressure

#### CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-680	10 CFR 50 Appendix R Safe Shutdown Equipment	17
M-736	Verify Technical Specification System Flow Requirements	3
M-928	10 CFR 50 Appendix R Safe Shutdown Analysis	16

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-944	10 CFR 50 Appendix R Alternate Shutdown Methodology – Time and Manpower Study/Safe Shutdown System Considerations	4
M-997, Appendix 2.1	Qualification of Penetration Seal Typical F-1, A Three Hour Fire Rated Six Inch Silicone Foam Seal	1
M-997, Appendix 2.14	Qualification of Penetration Seal Typical FRP-2, A Three Hour Fire Rated Grout Seal	3
M-1023	Cable Spreading CO2 Retention Time Verification Calculation	0
M-1088	10 CFR 50 Appendix R Post-Fire Operator Manual Action Feasibility	1
134-DC, Section 1, Attachment 1	Electrical Appendix R Analysis	4
335-DC	Emergency Lighting and Communications	7
9000040865 (STA-277)	RCP Seal Flow Assessment Should HCV-142 Fails Open	0

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
061352 Sheet 65A	Pyrocrete Enclosure 20-29-1	2
061352 Sheet 65B	Pyrocrete Enclosure 20-29-1	1
061881, Sheet 104	Ventilation As-Built Details For Fire Dampers	14
061881, Sheet 104A	Ventilation As-Built Details For Fire Dampers	14
061881, Sheet 104B	Ventilation As-Built Details For Fire Dampers	14
061881, Sheet 104C	Ventilation As-Built Details For Fire Dampers	14
066689	Penetrating Seal Typical Design Details	2
067998	DCPP Unit 2 Data Cable Report	16
102018, Sheet 1	Fire Protection Systems Piping Schematic	82
102018, Sheet 2	Fire Protection Systems Yard Loop	94
102018, Sheet 3	Fire Protection Systems Piping Schematic	86
102018, Sheet 4A	Fire Protection Systems Piping Schematic	47
102018, Sheet 5	Fire Protection Systems Piping Schematic	81

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
102018, Sheet 6	Carbon Dioxide Fire Protection System Hazard Spray Heads	73
102018, Sheet 6A	Carbon Dioxide Fire Protection System Hosereels	72
102018, Sheet 8	Carbon Dioxide Protection System For Intake Structure	38
106716, Sheet 1	Raw Water Storage Reservoir	124
106716, Sheet 11	Makeup Water System Piping and Instrumentation Diagram	124
107703	Auxiliary Feedwater System	59
108003, Sheet 4	Feedwater System Piping and Instrumentation Diagram	61
108004, Sheet 3	Turbine Steam Supply System Piping and Instrumentation Diagram	83
108004, Sheet 3	Turbine Steam Supply System Piping and Instrumentation Diagram	95
108004, Sheet 5	Turbine Steam Supply System Piping and Instrumentation Diagram	95
108007, Sheet 4	Reactor Coolant System Piping and Instrumentation Diagram	52
108008, Sheet 4	Chemical & Volume Control System Piping and Instrumentation Diagram	81
108008, Sheet 4B	Chemical & Volume Control System Piping and Instrumentation Diagram	97
108009, Sheet 4	Chemical & Volume Control System Piping and Instrumentation Diagram	69
108014, Sheet 5	Component Cooling Water System Piping and Instrumentation Diagram	47
108014, Sheet 5A	Component Cooling Water System Piping and Instrumentation Diagram	35
108018, Sheet 1	Fire Protection Systems Piping Schematic	43
108018, Sheet 2	Fire Protection Systems Yard Loop	45
108018, Sheet 4A	Fire Protection Systems Piping Schematic	29
108018, Sheet 5	Fire Protection Systems Piping Schematic	28
108018, Sheet 6	Carbon Dioxide Fire Protection System Hazard Spray Heads	36
108018, Sheet 6A	Carbon Dioxide Fire Protection System Hosereels	35

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
110031	Bill of Materials for Hot Shutdown Remote Control Panel	5
111906, Sheet 1	Fire Protection Cover Sheet	1
111906, Sheet 2	Fire Protection Symbols	1
111906, Sheet 11	Fire Protection Turbine Building Elevation 85'	3
111906, Sheet 12	Fire Protection Turbine Building Elevation 104'	2
111906, Sheet 13	Fire Protection Turbine Building Elevation 119'	1
111906, Sheet 18	Fire Protection Auxiliary Building Elevation 85'	3
111906, Sheet 20	Fire Protection Auxiliary Building Elevation 100'	2
111906, Sheet 22	Fire Protection Auxiliary Building Elevation 115'	2
111906, Sheet 23	Fire Protection Auxiliary Building Elevation 140'	3
111906, Sheet 25	Fire Protection Auxiliary Building Elevations 128', 154' & 164'	2
437630	Fire Pumps Schematic Diagram	10
437730	Key Plan Lighting Layout Drawings	7
441221	Unit 2 Diagram of Connections Hot Shutdown Panel	6
441222	Unit 2 Diagram of Connections Hot Shutdown Panel	10
441312	Unit 2 Schematic Diagram Charging Pumps No 21 & 22	25
441569	Wiring Diagram 4KV Switchgear Bus Section "F" Cell 11	9
441638	Unit 2 Diagram of Connections 4160 Volt Switchgear	17
452607	Unit 2 Diagram of Connections Main Control Board Section 2VB2	19
500736	Lighting Layout – Turbine Generator Building Below El. 85' -0" and 104' -0"	29
500738	Lighting Layout – Turbine Generator Building Below El. 119' -0"	16
500749	Lighting Layout – Auxiliary and Spent Fuel Bldg El. 115' -0"	26
502646	Unit 2 Diagram of Connection Elev. 73' -0", Area "H"	14
Sketch CA-97A	Barrier 418	7/15/99
Sketch TB-112	Barrier 3021	4/23/98

PROBLEM IDENTIFICATION REPORTS (Notifications and Tasks)

A0543845	A0620761	A0635344	A0645338
A0646033	A0656808	A0658257	A0658528
A0715723	A0715742	A0724491	50033373 Task 31*
50033373 Task 32*	50033373 Task 33*	50033373 Task 34*	50033373 Task 35*
50033373 Task 36*	50033373 Task 37*	50033869	50033929
50037563	50041124	50043276	5007772
50114752	50239973	50245430	50247371*
50253971*	50255863*	50256947	50256900
50256901	50256948	50257055*	5026087*
50256774*	50256981*	50256998*	60016540

\*Written as a result of inspection activities.

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AD7.ID2	Standard Plant Priority Assignment Scheme	11
CP M-6	Fire	31
CP M-10	Fire Protection of Safe Shutdown Equipment	20
ECG 18.1	Fire Suppression Systems/Fire Suppression Water Systems	7
ECG 18.2	Fire Hose Stations	7
ECG 18.3	Fire Detection Instrumentation	9
ECG 18.4	Spray and/or Sprinkler System	4
ECG 18.5	CO2 System	7
ECG 18.7	Fire Rated Assemblies	6
EOP E-0	Reactor Trip or Safety Injection	26
OM8	Fire Protection Program	2B
OM8.ID1	Fire Loss Prevention	21
OM8.ID2	Fire System Impairment	14

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP1.DC37	Plant Logs	39
OP AP-8A	Control Room Inaccessibility – Establishing Hot Standby	22
OP AP-8B	Control Room Inaccessibility – Hot Standby to Cold Shutdown	16
OP D-1:V	Alternative Auxiliary Feedwater Supplies	17
OP K-15	Important Manual Valves Requiring Lubrication and/or Exercising	11
MIP C-13.0	3M Interam Fire Protection System (DCP-212)	2A
STP I-34A	Fire Detection System Detector Functional Panel A	11
STP M-39B	Routine Surveillance Test of Cable Spreading room Carbon Dioxide Fire System Operation	23
STP M-67A	Fire Valve Inspection	45
STP M-67C	Monthly Hose Reel Station Inspection	20
STP M-69A	Monthly Fire Extinguisher Station Inspection Inside the Protected Area	39
STP M-70A	Inspection of Fire Barriers and HELB Penetration Seals	5
STP M-70B	Inspection Sheet/Fire and Smoke Dampers	6
STP M-70C	Inspection/Maintenance of Doors	6
STP M-70D	Inspection of Fire Barriers, Rated Enclosures, Credited Cable Tray Fire Stops and Equipment Hatches	12A
STP M-71	Firewater System Flow Test	8
STP P-CCP-21	Routine Surveillance Test of Centrifugal Charging Pump 2-1	20A
STP P-FPP-A01	Fire Pump 0-1 Performance Test	2
STP P-FPP-A02	Fire Pump 0-2 Performance Test	2A
STP P-FPP-B01	Fire Pump 0-1 Routine Surveillance	8
STP P-FPP-B02	Fire Pump 0-2 Routine Surveillance	7
STP P-MUW-A1	Comprehensive Test Procedure for Makeup Water Transfer Pump 0-1	6
STP V-3P4	Exercising Valves for Alternative Auxiliary Feedwater Supplies	18

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
	Cable Data Worksheet for CVCS-2-CCP1-RUN	October 3, 2007
Design Criteria Memorandum S-18	Fire Protection System	15A
Design Criteria Memorandum S-98	Penetration Seals	6
Design Criteria Memorandum T-13	Appendix R Fire Protection	4A
DCPP Technical Specification 3.3.4	Remote Shutdown System	
Fire Drill	4kV Vital Bus F Room Fire	July 9, 2009
Fire Hazards and Appendix R Evaluation 20	Bus Duct Penetrations	2
Fire Hazards and Appendix R Evaluation 131	Unique Blockout Penetration Seal Through Barrier Between The Unit-2 Turbine / Containment Penetration Areas	3
Fire Hazards and Appendix R Evaluation 145	Pyrocrete Enclosure Thickness	1
Fire Strategy Plan FD-TB-02	Turbine Building Elevation 119' Unit 2	1
Fuse Analysis Report	Fuse 2-SHF11-UT-03 and UT-01 in Panel SHF11	July 21, 2009
Fuse Analysis Report	Fuse 2-SHF11-UN-01 and UN-02 in Panel SHF11	July 21, 2009
Installation Booklet 6350-002	3M Interam E-54A Fire Protection Mat 3 Hour Flexible Wrap System For Electrical Raceways	October 27, 1987
Licensing Basis Impact Evaluation Screen 2003-004	Change to FSAR Appendix 9.5H	March 14, 2003
LJP-007	Align 480V Buses for Control from the Hot Shutdown Panel	14
LJP-008	Close an MSIV FVC-43 Locally	19
LJP-038	Perform a Local Start of a Diesel Generator	19
NUREG 0675	Diablo Canyon, Units 1 and 2 Safety Evaluation Report	October 12, 1974
NUREG 0675,	Diablo Canyon, Units 1 and 2 Safety Evaluation	November 15,



<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
SSER 8	Report, Supplement 8	1978
NUREG 0675, SSER 9	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 9	June 1980
NUREG 0675, SSER 13	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 13	April 1981
NUREG 0675, SSER 23	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 23	June 1984
NUREG 0675, SSER 27	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 27	July 1984
NUREG 0675, SSER 31	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 31	April 1985
NUREG 0675, SSER 32	Diablo Canyon, Units 1 and 2 Safety Evaluation Report, Supplement 32	July 1985
R032C12	Operations Responder Responsibilities, Instructor Lesson Guide	0
Report Number 081273	Supplement to Report of Examination of Fire and Smoke Detection System at Units 1 & 2, Diablo Canyon	May 9, 1986
Report Number 15594-100408- 100410	Fire Endurance Test of Pyrocrete Box Fire Protective Envelopes – Three Box Enclosures (two containing 4 inch steel conduit and one containing a steel junction box)	October 18, 1996
System Training Guide A-8	Remote/Hot Shutdown Panels	6
Updated Final Safety Analysis Report, Section 9.5.1	Fire Protection System	18
Updated Final Safety Analysis Report, Appendix 9.5D	Emergency Lighting Capability Evaluation To 10 CFR 50, Appendix R, Section III.J	16
Updated Final Safety Analysis Report, Appendix 9.5E	10 CFR 50, Appendix R, Section III.L, Alternate and Dedicated Shutdown Capability	15
Updated Final Safety Analysis Report, Appendix 9.5G	Equipment Required for Safe Shutdown	18
Vendor Instruction Manual	Teledyne Big Beam Instruction Manual for 6SL and 6SN Battery Operated Lights	3

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
DC 663343-55-3		
Vendor Manual	Type W-2 Rotary Instrument & Control Switch	January 1968
Work Order 64007709	U1 Replace Battery Operated Lights	

**WORK ORDERS**

64004697	64004701	64004704	64004706	64005422
64005583	64005558	64005853	64005854	64005855
64005856	64005860	64005863	64005864	64020678
64020681	R0283256	R0283285	R0283287	R0283289
R0297466				