UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

August 22, 2013

Mr. Edward D. Halpin
Senior Vice President and
Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 56, Mail Code 104/6
Avila Beach, CA 93424

SUBJECT: DIABLO CANYON POWER PLANT, UNITS 1 AND 2 – NRC COMPONENT DESIGN BASIS INSPECTION REPORT 05000275/2013007 and 05000323/2013007

Dear Mr. Halpin:

On July 11, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Diablo Canyon Power Plant, Units 1 and 2. The enclosed inspection report documents the inspection results which were discussed on July 11, 2013, with Mr. B. Allen, 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 inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Three NRC identified findings were identified during this inspection. All of the findings were determined to have very low safety significance (Green). All of the findings were determined to involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCV's) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these non-cited violations, you should provide a 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 DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Diablo Canyon Power Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305. In addition, if you disagree with the characterization of the cross-cutting aspect assigned to 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 Diablo Canyon Power Plant, Units, 1 and 2.

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 NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Thomas R. Farnholtz, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos.: 50-275; 50-323
License Nos.: DPR-80; DPR-82

Enclosure:
Inspection Report 05000275/2013007
and 05000323/2013007
w/ Attachment: Supplemental Information

cc w/encl:
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Units 1 and 2

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SRI:DRS/EB1	RI:DRS/EB1	RI:DRS/EB2	SOE:DRS/OB	SRI:DRS/EB1	C:DRP/PBB
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8/14/13	8/14/13	8/15/13	8/14/13	8/15/13	8/19/13
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Dockets:	50-275; 50-323
Licenses:	DPR-80; DPR-82
Report Nos.:	05000275/2013007 and 05000323/2013007
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:	June 10 - July 11, 2013
Team Leader:	W. Sifre, Senior Reactor Inspector, Engineering Branch 1
Inspectors:	R. Latta, Senior Reactor Inspector C. Osterholtz, Senior Operations Engineer C. Hale, Reactor Inspector J. Watkins, Reactor Inspector
Accompanying Personnel:	S. Kobylarz, Beckman and Associates B. Sherbin, Beckman and Associates
Approved By:	Thomas R. Farnholtz, Chief Engineering Branch 1 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000275; 05000323/2013007; 06/10/2013 – 07/11/2013; Diablo Canyon Power Plant, Units 1 and 2: Baseline inspection, NRC Inspection Procedure 71111.21, "Component Design Basis Inspection."

The report covers an announced inspection by a team of five regional inspectors and two contractors. Three NRC identified findings were identified during this inspection. The findings were determined to have very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 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 NRCs 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 Findings

Cornerstone: Mitigating Systems

- Green. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures and instructions." Specifically, as of July 11, 2013, the licensee failed to evaluate the impact of the site combustion air temperature and the vendor-specified diesel generator rating for combustion air temperature in the emergency diesel generator loading analysis. In addition, the licensee failed to evaluate the available combustion air temperature for the maximum site outside air conditions could have affected the capability of safety-related equipment to respond to initiating events. This finding was entered into the corrective action program as Notifications DN-50573049 and DN-50570764.

  The team determined that the failure to properly evaluate the vendor stated effects of combustion air temperature on the diesel generator capability and to determine and evaluate the expected maximum value for diesel generator combustion air temperature, based on site-specific conditions, was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, using actual data, the licensee found that derating of 1.5 percent was necessary under limiting air temperature conditions. Using Inspection Manual Chapter 0609, Significance Determination Process, Appendix A, the finding was determined to have very low safety significance (Green) because the finding was a design or qualification deficiency that did not result in the loss of operability or functionality, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. This finding had a problem identification and resolution cross-cutting aspect associated with thoroughly evaluating problems such that the resolution addresses cause and extent of condition [P.1(c)] (1R21.2.4).

- Green. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures and instructions." Specifically, as of July 11, 2013, the licensee failed to evaluate the effects of pump load on the auxiliary feedwater pump motor for the design basis maximum flow conditions that could occur during a postulated steam line break coincident with maximum diesel generator frequency which could have affected the capability of safety-related equipment to respond to initiating events. This finding was entered into the corrective action program as Notification DN-50572850.

  The team determined that the failure to evaluate the capability of auxiliary feedwater pump motors for the design basis accident maximum pump brake horsepower condition coincident with the maximum diesel generator frequency, which could result in a motor overload, was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was no analysis or test that demonstrated the motors would be capable of operating for the required mission time during a high energy line break, which resulted in maximum pump brake horsepower conditions that could occur coincident with maximum diesel engine frequency. Using Inspection Manual Chapter 0609, Significance Determination Process, Appendix A, the finding was determined to have very low safety significance (Green) because the finding was a design or qualification deficiency that did not result in the loss of operability or functionality, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance (1R21.2.4).

- Green. The team identified a Green non-cited violation associated with Technical Specification 5.4.1(a), "Procedures," which requires that written procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, Revision 2, Appendix A. Regulatory Guide 1.33, "Quality Assurance Program," Appendix A, Section 5, requires procedures for Abnormal, Offnormal, or Alarm Conditions. Specifically, as of July 11, 2013, Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 27, Attachment 7.8, "Temporary Ventilation for the Control Room, Inverter/Charger Rooms, and 480V Vital Switchgear Rooms and Charging Pump 1-3 Room," Section 4a, requires the use of two 24-inch diameter fans, which, if connected as directed, would not perform the function as prescribed by the procedure as the fans require more current than can be supplied from either the equipment room receptacles or from the alternate power source (the temporary generator and distribution panel). This finding was entered into the corrective action program as Notifications DN-50570838 and DN-50572295.

  The team determined that the failure to provide an adequate procedure for establishing temporary ventilation was a performance deficiency. The finding was more than minor because it affected the equipment performance attribute associated with the Mitigating Systems Cornerstone as related to the availability, reliability, and capability of the 480V Vital Switchgear Rooms. The team reviewed this finding using

Inspection Manual Chapter 0609 Attachment 0609.04; 0609 Appendix A, Exhibit 2; and Inspection Manual 0609 Appendix A, Exhibit 4, because it affected the External Event Mitigation Systems (Seismic/Fire/Flood/Severe Weather Protection Degraded) while the plant was at power and involved the loss or degradation of equipment specifically designed to mitigate an external initiating event such as a fire. Inspection Manual Chapter 0609 Appendix A, Exhibit 4, led to a Detailed Risk Evaluation because the finding would degrade two or more trains of a multi-train system or function and would degrade one or more trains of a system that supports a risk significant system or function. The bounding change to the core damage frequency was 4E-7/year (Green). The finding was not a significant contributor to the large early release frequency. The most dominant sequences included fires in Fire Area 34, failure of the 480 Vac switchgear cooling, and the failure of the manual action to restore cooling. The low frequency of applicable fires combined with the relatively low failure probability for the alternate cooling helped to reduce the risk. This finding had a human performance cross-cutting aspect associated with resources, because the licensee did not have adequate procedures and available facilities and equipment, including physical improvements, simulator fidelity and emergency facilities and equipment [H.2 (d)] (1R21.2.14).

B. Licensee-Identified Violations

No findings were identified.

REPORT DETAILS

1 REACTOR SAFETY

Inspection of component design bases verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected components and operator actions to perform their design bases functions. As plants age, their design bases may be difficult to determine and important design features may be altered or disabled during modifications. The plant risk assessment model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance.

1R21 Component Design Bases Inspection (71111.21)

To assess the ability of the Diablo Canyon Power Plant, Units 1 and 2, equipment and operators to perform their required safety functions, the team inspected risk significant components and the licensee's responses to industry operating experience. The team selected risk significant components for review using information contained in the Diablo Canyon Power Plant, Units 1 and 2, probabilistic risk assessment and the U.S. Nuclear Regulatory Commission's (NRC) standardized plant analysis risk model. In general, the selection process focused on components that had a risk achievement worth factor greater than 1.3 or a risk reduction worth factor greater than 1.005, or a Birnbaum value greater than 1E-6. The items selected included components in both safety-related and nonsafety-related systems including pumps, circuit breakers, heat exchangers, transformers, and valves. The team selected the risk significant operating experience to be inspected based on its collective past experience.

.1 Inspection Scope

To verify that the selected components would function as required, the team reviewed design basis assumptions, calculations, and procedures. In some instances, the team performed calculations to independently verify the licensees conclusions. The team also verified that the condition of the components was consistent with the design bases and that the tested capabilities met the required criteria.

The team reviewed maintenance work records, corrective action documents, and industry operating experience records to verify that licensee personnel considered degraded conditions and their impact on the components. For the review of operator actions, the team observed operators during simulator scenarios, as well as during simulated actions in the plant.

The team performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases have been correctly implemented and maintained. This design margin assessment considered original design issues, margin reductions because of modifications, and margin reductions identified as a result of material condition issues. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as failed performance test results; significant corrective actions; repeated maintenance; 10 CFR 50.65(a)1 status; operable, but degraded conditions; the NRC resident inspector input of problem equipment; system health reports; industry operating experience; and

licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in-depth margins.

The inspection procedure requires a review of 15 to 25 total samples that include risk-significant and low design margin components, containment-related components, and operating experience issues. The sample selection for this inspection was 17 components, three of which are containment-related, and four operating experience items. The selected inspection and associated operating experience items supported risk significant functions including the following:

a. Electrical power to mitigation systems: The team selected several components in the electrical power distribution systems to verify operability to supply alternating current (ac) and direct current (dc) power to risk significant and safety-related loads in support of safety system operation in response to initiating events, such as loss of offsite power, station blackout, and a loss-of-coolant accident with offsite power available. As such, the team selected:

- 480V Switchgear Bus 1F
- Nuclear Instrument Uninterruptable Power Supply 11 (1Y11)
- Startup Transformer No. 12 Main Breaker to 4160V Bus F (52HF14)
- Emergency Diesel Generator 13
- 125 Vdc Class 1E Batteries
- 125 Vdc Class 1E Battery Chargers

b. Mitigating systems needed to attain safe shutdown: The team reviewed components and supporting equipment required to perform the safe shutdown of the plant. As such, the team selected:

- Refueling Water Storage Tank Level Switches
- Containment Electrical Penetration Assemblies
- Turbine Building Shear Wall on Column Line 31
- Unit 1 and Unit 2 Motor Driven Auxiliary Feedwater Pumps
- Unit 1 and Unit 2 Turbine Driven Auxiliary Feedwater Pumps
- Unit 1 and Unit 2 Residual Heat Removal Pumps
- Unit 1 and Unit 2 Residual Heat Removal Heat Exchangers
- 480V Switchgear Ventilation
- Auxiliary Saltwater Building and Vault Drain Check Valves
- Containment Hatch Seals
- Containment Purge Valves

.2 Results of Detailed Reviews for Components

.2.1 480 Volt Switchgear Bus 1F

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, the current system health report, calculations, maintenance and test procedures, and condition reports associated with the 480 Vac safety-related switchgear bus 1F.

The team also performed walkdowns and conducted interviews with engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- One line diagrams and schematics of record for switchgear bus and auxiliary equipment
- Maintenance history to verify the monitoring and correction of potential degradation
- Vendor installation and maintenance manuals
- Calculations for electrical distribution system load flow/voltage drop, short-circuit, and electrical protection and coordination
- Protective device settings and circuit breaker ratings to confirm adequate selective protection and coordination of connected equipment during worst-case short circuit conditions
- Circuit breaker preventive maintenance, inspection, and testing procedures to confirm inclusion of relative industry operating experience and vendor recommendations
- Results of completed preventive maintenance on switchgear and breakers
- Listing of condition reports for the past 3 years for repetitive conditions affecting reliability

b. Findings

No findings of significance were identified.

.2.2 Nuclear Instrument Uninterruptable Power Supply 11 (1Y11)

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the Nuclear Instrument UPS 11. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- One line diagrams and schematics of record for the inverter
- Vendor test reports
- Vendor installation and maintenance manuals

- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations
- Protective device coordination studies
- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.3 Start-up Transformer No. 12 Main Circuit Breaker to 4160 volt Bus F (52HF14)

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with start-up transformer No. 12 main breaker to 4160 volt bus F. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- One line diagrams of record
- Bus transfer analysis
- Vendor installation and maintenance manuals
- Vendor technical manual for the circuit breaker
- Electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination calculations
- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.4 Diesel Driven Generator No. 13

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the emergency diesel generator 13. The team also performed walkdowns, and conducted interviews with system and design

engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically the team reviewed:

- Schematics of record and vendor documents for the emergency diesel start and trip circuits and the generator field flash, starting solenoid and breaker close and trip circuits
- Vendor nameplate data and specifications for the generator
- Calculations of record for determining diesel generator load under design/licensing basis conditions
- Calculations of record and supporting documentation for determining break horsepower loads for the major pumps loaded on the diesel generator under design/licensing basis conditions
- Calculations of record and supporting documentation for determining minimum voltage at generator field flash relays, starting air solenoids, and generator breaker close and trip coils under design/licensing basis conditions
- Vendor nameplate data and specifications for selected motors
- Calculations of record for determining minimum motor terminal voltage under design/licensing basis conditions
- Calculations of record for selected motor overcurrent protection settings and alarms
- Listing of condition reports for the past 3 years involving the generator breaker, field flash relays, and starting air solenoids

b. Findings

1. Failure to Evaluate the Effects on the Emergency Diesel Generator Load Capability for Maximum Combustion Air Temperature Conditions

Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure to evaluate the effects on the emergency diesel generator load capability for the maximum combustion air temperature conditions.

Description. The team reviewed the calculation for diesel generator loading and found that a design input stated that de-rating the diesel generator for combustion air temperature was not required. However, the team found that the site had performed an evaluation in Notification DN-50517234 for vendor information received from Fairbanks Morse in October 2012, that specified derating the diesel generator for diesel combustion air temperature greater than 90°F. The team found that the licensee did not consider the engine required any derating due the application of a statistical analysis of site temperatures that predicted less than 90°F for combustion air temperature. Licensing Basis Verification Project Report Document No. 14078101-LR-012-0, dated December 20, 2012, concluded, "A DG rating would be based on maintaining an air

temperature less than or equal to 90°F and the cooling water inlet temperature to the water cooler less than or equal to 160°F. Based on the information above, no derating is required since the air inlet temperature is less than 90°F which controls the cooling water temperature to be below 160°F." The team determined that the statement was based on a vendor-performed statistical analysis of site area temperature that failed to recognize that the diesel engine combustion air temperature is the temperature at the air intake to the diesel in an enclosed room, not outside air temperature.

The final safety analysis report, Section 2.3.2.2.2, Ambient Air Temperature, stated the highest hourly temperature recorded at the Diablo Canyon site through the year 2000 was 97°F in October 1987. During the inspection, the licensee evaluated more recent data from the site meteorological tower and found a 99°F temperature reading to be the current maximum temperature. The team questioned whether the licensee had evaluated the potential for heat-up in the air available at the air intake filter to the diesel engine from the engine radiator exhaust duct that was located adjacent to the air filter. The team also questioned whether the combustion air temperature at the tornado barrier to the diesel room was determined to be the same temperature as the air temperature at the meteorological tower. Upon further review, the licensee determined that the heat-up in the air at the air filter and the temperature difference between the meteorological tower and the tornado barrier had not been evaluated. Based on this analysis, the temperature difference between the meteorological tower and the air inlet filter was approximately 19°F which resulted in approximately a 118.2°F combustion air temperature for the site maximum temperature of 99°F. The licensee determined that a 120°F maximum design combustion air temperature would be considered, which required an engine derate of 1.5 percent in accordance with Fairbanks Morse requirements.

Analysis. The team determined that the failure to properly evaluate the vendor stated effects of combustion air temperature on the diesel generator capability and to determine and evaluate the expected maximum value for diesel generator combustion air temperature, based on site-specific conditions, was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, using actual data, the licensee found that derating of 1.5 percent was necessary under limiting air temperature conditions. Using Inspection Manual Chapter 0609, Significance Determination Process, Appendix A, the finding was determined to have very low safety significance (Green) because the finding was a design or qualification deficiency that did not result in the loss of operability or functionality, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. This finding had a problem identification and resolution cross-cutting aspect associated with thoroughly evaluating problems such that the resolution addresses cause and extent of condition [P.1(c)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures and instructions." Contrary to the above, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures and instructions. Specifically, as of July 11, 2013,

the licensee failed to evaluate the impact of the site combustion air temperature and the vendor specified diesel generator rating for combustion air temperature in the emergency diesel generator loading analysis and that the failure to evaluate the available combustion air temperature for the maximum site outside air conditions could have affected the capability of safety-related equipment to respond to initiating events. This finding was entered into the corrective action program as Notifications DN-50573049 and DN-50570764. Because this finding was of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with the NRC Enforcement Policy: NCV 05000275/2013007-01 and 05000373/2013007-01, "Failure to Evaluate the Effects on the Emergency Diesel Generator Load Capability for Maximum Combustion Air Temperature Conditions."

2. Failure to Evaluate the Auxiliary Feedwater Pump Motor Capability for the Effects of Pump Maximum Breakhorsepower Conditions

   Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure to evaluate the auxiliary feedwater pump motor capability for the effects of pump maximum brake horsepower conditions.

   Description. The team found that the licensee did not evaluate the impact on the auxiliary feedwater pump motor for pump brake horsepower conditions that resulted from predicted maximum flow and maximum frequency conditions. Specifically, the licensee failed to evaluate the effects on the rated 600 HP auxiliary feedwater pump motor for the design basis maximum flow conditions that could occur during a postulated steam line break coincident with maximum diesel generator frequency. The auxiliary feedwater pump motor nameplate did not have a National Electrical Manufacturers Association (NEMA) specified service factor rating that would have allowed for a temporary motor overload without damaging the motor. The licensee determined that the resultant brake horsepower for this condition was approximately 655 horsepower, which represented a motor overload of approximately nine percent. This condition was entered into the corrective action program as Notification DN-50572850.

   Analysis. The team determined that the failure to evaluate the capability of auxiliary feedwater pump motors for the design basis accident maximum pump brake horsepower condition coincident with the maximum diesel generator frequency, which could result in a motor overload, was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was no analysis or test that demonstrated the motor would be capable of operating for the required mission time during a high energy line break, which resulted in maximum pump brake horsepower conditions that could occur coincident with maximum diesel engine frequency. Using Inspection Manual Chapter 0609, Significance Determination Process, Appendix A, the finding was determined to have very low safety significance (Green) because the finding was a design or qualification deficiency that did not result in the loss of operability or functionality, did not result in a loss of safety function, and did not screen as potentially risk significant due to external events. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures and instructions." Contrary to the above, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures and instructions. Specifically, as of July 11, 2013, the licensee failed to evaluate the effects of the pump load on the auxiliary feedwater pump motor for the design basis maximum flow conditions that could occur during a postulated steam line break coincident with maximum diesel generator frequency which could have affected the capability of safety-related equipment to respond to initiating events. This finding was entered into the corrective action program as Notification DN-50572850. Because this finding was of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with the NRC Enforcement Policy:
NCV 05000275/2013007-02 and 05000373/2013007-02, "Failure to Evaluate the Auxiliary Feedwater Pump Motor Capability for the Effects of Pump Maximum Brake Horsepower Conditions."

.2.5 Unit 1 and Unit 2 - 125Vdc Class 1E Batteries

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the Unit 1 and Unit 2 125Vdc safety-related battery banks. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of these components to perform their desired design basis function. Specifically, the team reviewed:

- Battery bank sizing calculations
- Short circuit current calculations
- Vendor installation and maintenance manuals and drawings
- Coordination studies and design specifications
- Modifications made to the battery and battery rack
- Seismic tests and analyses
- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.6 Unit 1 and Unit 2 - 125Vdc Safety Related Battery Chargers

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the Unit 1 and Unit 2 125Vdc safety-related battery chargers. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of these components to perform their desired design basis function. Specifically, the team reviewed:

- Circuit breaker coordination studies
- Short circuit and sizing calculations
- Vendor installation and maintenance manuals and drawings
- Circuit breaker coordination studies and design specifications
- Design specifications
- Seismic tests and analyses
- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.7 Refueling Water Storage Tank Level Switches

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the Unit 1 and Unit 2 refueling water storage tank level switches. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of these components to perform their desired design basis function. Specifically, the team reviewed:

- Sizing calculations
- Design specifications
- Vendor installation and maintenance manuals and drawings
- Seismic tests and analyses

- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.8 Containment Electrical Penetration Assemblies

a. Inspection Scope

The team reviewed the updated safety analysis report, design criteria memorandum, calculations, the current system health report, selected drawings, maintenance and test procedures, and condition reports associated with the Unit 1 and Unit 2 containment electrical penetration assemblies. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of these components to perform their desired design basis function. Specifically, the team reviewed:

- Sizing and short circuit calculations
- Design specifications
- Vendor installation and maintenance manuals and drawings
- Replacement specifications to assure compliance with NUREG 0588 specifications
- Preventive maintenance and testing procedures to determine adequacy relative to industry and vendor recommendations

b. Findings

No findings of significance were identified.

.2.9 Turbine Building Shear Wall on Column Line 31

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, selected calculations and drawings, maintenance procedures, and condition reports associated with the turbine building shear wall on column line 31. The team also performed walkdowns and conducted interviews with engineering personnel to ensure the capability of this component to perform its desired design basis function. Specifically, the team reviewed:

- Turbine building design criteria
- Civil calculations and floor response spectra

- Design drawings for modifications due to Hosgri loading and installation of emergency diesel generator 2-3
- Maintenance rule structural monitoring procedures
- Concrete crack maps and corrective action documents related to maintenance rule structural monitoring inspections
- The visible material condition and configuration of the shear wall

b. Findings

No findings of significance were identified.

.2.10 Motor-Driven Auxiliary Feedwater Pumps 1-2 and 2-2

a. Inspection Scope

The team reviewed the updated safety analysis report, system description, the current system health report, selected drawings, maintenance and test procedures, and corrective actions associated with motor-driven auxiliary feedwater pumps 1-2 and 2-2. The team also performed a system walkdown and conducted interviews with design engineering personnel to ensure the capability of these components to perform their desired design basis functions. Specifically, the team reviewed:

- System design documents and inservice test results
- Current system health reports and pump curves
- Selected drawings, test procedures and vendor manuals.
- Past corrective and preventive actions and system modifications
- Previous operability determinations to ensure that effected equipment could satisfy applicable design requirements
- Previous maintenance and repair activities including evaluation of industry operating experience
- Quarterly and full flow surveillance procedures and test results used to monitor potential pump degradation

b. Findings

No findings of significance were identified.

.2.11 Turbine-Driven, Auxiliary Feed Pumps 1-1 and 2-1

a. Inspection Scope

The team reviewed the updated safety analysis report, the current system health report, selected drawings, maintenance and test procedures, and corrective action documents associated with the turbine-driven auxiliary feedwater pumps 1-1 and 2-1. The team also performed walkdowns and conducted interviews with system and design engineering personnel to ensure the capability of these components to perform their desired design basis function. Specifically, the team reviewed:

- System design documents and inservice test results
- Current system health reports
- Selected drawings, test procedures and vendor manuals
- Past corrective and preventive actions and system modifications
- Previous operability determinations to ensure that effected equipment could satisfy applicable design requirements
- Previous maintenance and repair activities including evaluation of industry operating experience
- Quarterly and full flow surveillance procedures and test results used to monitor potential pump degradation

b. Findings

No findings of significance were identified.

.2.12 Residual Heat Removal Heat Exchangers 1-2 and 2-1

a. Inspection Scope

The team reviewed the updated safety analysis report, the current system health reports, selected drawings, maintenance and test procedures, and corrective action documents associated with the residual heat removal pumps 1-2 and 2-1. The team also performed system walkdowns and conducted interviews with engineering personnel to ensure the capability of these components to perform their desired design basis functions. Specifically, the team reviewed:

- Corrective action program documents and system health reports
- Piping and instrumentation diagrams
- Residual heat removal system operating instructions and vendor manuals.
- Residual heat removal pumps 1-2 and 2-1 quarterly surveillance tests.

- Technical specifications and design bases documents.

- Previous operability determinations to ensure that affected equipment could satisfy applicable design requirements.

b. Findings

No findings of significance were identified.

.2.13 Residual Heat Removal Pumps 1-2 and 2-1

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, the current system health report, selected drawings, maintenance and test procedures, and corrective action documents associated with the residual heat removal heat exchangers 1-2 and 2-1. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of these components to perform their desired design basis functions. Specifically, the team reviewed:

- Work orders and corrective action program documents

- System design criteria and system health reports

- Corrective action program documents to verify the monitoring and correction of potential degradation, and apparent cause evaluations

- Piping and instrumentation diagrams

- Closed cooling water chemistry controls used to prevent heat exchanger degradation

b. Findings

No findings of significance were identified.

.2.14 Safety Related 480 Volt Switchgear Area Ventilation

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, the current system health report, selected drawings, maintenance and test procedures, and corrective action documents associated with the safety related 480V switchgear area ventilation system. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of the components in the system to perform their desired design basis functions. Specifically, the team reviewed:

- Heating, ventilation and air conditioning calculations for fan sizing and room cooling loads

- System design criteria and system health reports

- Recent preventive maintenance records to ensure air filters, fan motors and dampers are maintained in working order

- Previous operability determinations to ensure that affected equipment could satisfy applicable design requirements.

b. Findings

Inadequate Procedures for Establishing Temporary Ventilation

Introduction. The team identified a Green non-cited violation associated with Technical Specification 5.4.1(a), "Procedures," which requires that written procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, Revision 2, Appendix A. Regulatory Guide 1.33, "Quality Assurance Program," Appendix A, Section 5, requires procedures for Abnormal, Offnormal, or Alarm Conditions. Specifically, Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 27, Attachment 7.8, "Temporary Ventilation for the Control Room, Inverter/Charger Rooms, and 480V Vital Switchgear Rooms and Charging Pump 1-3 Room," Section 4a, requires the use of two 24-inch diameter fans. If connected as directed, the fans would not perform the function as prescribed by the procedure as the fans require more current than can be supplied from either the equipment room receptacles or from the alternate power source (temporary generator and distribution panel).

Description. Operators enter Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Attachment 7.8, "Temporary Ventilation for the Control Room, Inverter/Charger Rooms, and 480V Vital Switchgear Rooms and Charging Pump 1-3 Room," from several alarm response procedures, not just in response to a fire. Annunciator Response Procedure AR PK15-09, "Electrical Rooms Temperature Monitor," Section 2.4 directs the use of CP M-10, Attachment 7.8, for temporary bus ventilation when high temperatures are detected by Electrical Rooms Monitor Temperature 74 ER11 in the affected rooms and Annunciator Response Procedure AR PK15-19, "ESF 480V/DC Rooms Vent Trouble," directs the use of CP M-10, Attachment 7.8, if trouble is indicated by flow switch FS 5039X and breaker 27-1F-05 or flow switch FS 5040X and breaker 27-1H-07 which are flow switches and breakers associated with the ventilation systems. In addition, "Equipment Control Guidelines 23.6," 480 VAC Class 1 Switchgear Ventilation System" has "REQUIRED ACTION" B.2 if both trains of 480 VAC Class 1 Switchgear Ventilation are unavailable to immediately establish alternate ventilation for area cooling using CP M-10, "Fire Protection of Safe Shutdown Equipment," Attachment 7.8.

Specifically, Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 27, Attachment 7.8, "Temporary Ventilation for the Control Room, Inverter/Charger Rooms, and 480V Vital Switchgear Rooms and Charging Pump 1-3 Room," Section 4a, requires the use of two 24-inch diameter fans, one to provide the supply air and one to provide the exhaust air and four 16 inch fans to provide room ventilation to the 480V Vital Switchgear Rooms. The team (while walking down the setup of the fans and the temporary generator connections) inspected locations where the fans were stored, and observed that there were several 24-inch fans with differing nameplate data. The nameplate data on the 24-inch fans varied from 18.0 amps to 20.4 amps with one fan having its nameplate ratings specified as 6000 watts start and 2100

watts run. This data would translate to 52.17 amps start and 18.26 amps run based upon 115 Volts which is the motor rated voltage. All of these current values would exceed the breaker manufacturers recommended maximum of 80 percent of rating which would translate to 16.0 amps maximum.

The current requirements for the 24-inch fans along with the 16-inch fans if connected to the room receptacles would have overloaded the receptacle breakers and the 24-inch fans alone would have overloaded the circuit breakers on the procedure specified distribution panel. The manufacturer of the distribution panel used in this procedure stated that the loading of the 24-inch fans at 20 amperes each would trip the 20-amp breakers in approximately 45 minutes and this was documented in Notification DN-50570838. Specifically, the procedure requires the use of two 24-inch fans that require a starting and running current that exceeds the room receptacle circuit breakers current rating and the required distribution panel manufactures breaker ratings. After the team pointed out the procedure and equipment inadequacy for the 480V Vital Switchgear Rooms the licensee looked at other rooms that Procedure CP M-10 Attachment 7.8 was used for and found that the procedure was also inadequate for these other rooms without modifications to the procedure and equipment. This procedure and equipment inadequacy would render the temporary ventilation system non-functional. The resolution of the non conformance which is documented as 'interim corrective action' in the Notification DN-50570838 was to use "two 16-inch fans in place of one 24-inch fan" except for the control room procedure the Notification states to use "four 16 inch fans in place of one 24-inch fan" so as not to trip the breakers. In addition the licensee removed the 24-inch fans from their various storage areas. At the time that Notification DN-50570838 was written there was no functionality determination performed for the existing 24-inch fans.

The fans used in Procedure CP M-10 are administratively controlled by Administrative Procedure OM7.ID12, "Operability Determination," Revision 26, which addresses determination of equipment functionality and operability. Operability of fire protection systems are controlled by Equipment Control Guidelines. The operation of the temporary fans is controlled by ECG 23.6, "480 VAC Class I Switchgear Ventilation System." The team reviewed Administrative Procedure OM7.ID12 and determined that Operations Shift Management is responsible for the determination of whether equipment is operable. Section 5.3.6 of this procedure stated, "if at any time during evaluation of functionality, there is not a reasonable expectation that the equipment is functional, the Shift Manager (SM) or Shift Foreman (SFM) shall declare the equipment non-functional." The team reviewed Notification DN-50570838, which was written on June 26, 2013. No functionality determination was performed until the team asked the licensee what information, if any, was communicated to the operators about changing the fans as described in the Notification. The team was informed that a functionality determination was performed on July 8, 2013.

Analysis. The team determined that the failure to provide an adequate procedure for establishing temporary ventilation was a performance deficiency. The finding was more than minor because it affected the equipment performance attribute associated with the Mitigating Systems Cornerstone as related to the availability, reliability, and capability of the 480V Vital Switchgear Rooms. The team reviewed this finding using Inspection Manual Chapter 0609 Attachment 0609.04, 0609 Appendix A, Exhibit 2, and Exhibit 4, because it affected the External Event Mitigation Systems (Seismic/Fire/Flood/Severe Weather Protection Degraded) while the plant was at power and involved the loss or

degradation of equipment specifically designed to mitigate a external initiating event such as a fire. Inspection Manual Chapter 0609 Appendix A, Exhibit 4, led to a Detailed Risk Evaluation because the finding would degrade two or more trains of a multi-train system or function and would degrade one or more trains of a system that supports a risk significant system or function.

During a fire in Fire Area 34, the entire safety function of the 480 Vac heating and ventilation (HVAC) system could be lost. The performance deficiency had existed for many years, so the senior reactor analyst used the maximum significance determination process exposure period of one year.

A Region IV senior reactor analyst performed a bounding detailed risk evaluation for this performance deficiency. The analyst used the "Diablo Canyon Standardized Plant Analysis Risk (SPAR)," model, Revision 8.20, with a truncation of E-11. The analyst evaluated two separate conditions:

- Fires: The temporary fans were credited for a fire in Fire Area 34, because both trains of safety-related 480 Vac ventilation could become inoperable during a single fire

- Common cause failures of the four 480 Vac switchgear ventilation fans

The licensee indicated that breakers in the switchgear rooms could start to trip at 136 degrees °F because of the high local ambient temperatures. Calculation M-912, Figure 4.5.2, "Time (Hr) after Loss of HVAC," Revision 0, specified that the licensee had approximately eight hours following HVAC failure before the ambient room temperature exceeded 130 °F. This was more than sufficient time to install the temporary fans.

During initial installation, operators would likely use the normal non-safety 110 ac power supply at the local wall sockets. However, the breaker would trip before operators could install all of the fans. The equipment operators had two options for alternate power.

1. First, they could use one or more of the portable power generators at the site. The generator was supplied with several outlet sockets. Each socket had an individual trip device. These devices had breakers that would trip if the 24-inch diameter fans were used. But, the electrical sockets could be used to run the 16-inch diameter fans. Operators would need to recognize that the larger fans could not be used and they would need to substitute smaller fans. Operators may not prefer this particular option because of the effort needed to move the generator and to run numerous extension cords from the ground floor to the 480 Vac switchgear rooms. In addition, the smaller fans would not move as much air as the larger fans, so additional fans and another generator might be needed.

2. The second option simply involved running extension cords to house electrical outlets that came from different house breakers. This option was not proceduralized but it was an action that operators would likely attempt. Considering that several hours were available to perform these measures, the analyst determined that the actions were feasible.

The SPAR model included a basic event for recovery of room cooling. This basic event accounted for the manual actions to place temporary fans in the 480 Vac switchgear rooms. The analyst adjusted the performance shaping factors for the nominal and current case configurations. The analyst assumed that the diagnosis portion was rudimentary (not a risk driver and was not impacted by the performance deficiency). Therefore, all adjustments were made to the "Action" performance shaping factors. The nominal case was the instance where the performance deficiency did not exist. This reflected the failure probability assuming that the procedure provided accurate and effective guidance. The nominal case performance shaping factors were as follows:

Available time – Expansive (more than 50X the required time). While this much time was not available for completion of all of the procedure's actions, the equipment operators would only need to install a few fans to obtain more time. The operators were providing cooling for three safety related rooms but cooling of just one room would avert core damage. Therefore, the amount of time needed to avoid core damage was minimal.

The remainder of the performance shaping factors were considered nominal.

The resultant failure probability for the nominal case was 1E-5.

The current case calculation reflected the performance deficiency. The performance deficiency caused an increase to the failure probability. The current case performance shaping factors for the Action were as follows:

Available time – Extra (about 5X the required time). The deficient procedure would result in unexpected component responses (breaker trips causing fan failures). The operators would need to improvise to find a successful strategy. Still, air flow through one room would buy the operators additional time to complete all of their actions.

Procedures – Incomplete (information is needed that is not contained in the procedure).

The rest of the performance shaping factors were left at their nominal value.

The resultant failure probability for the current case was 2E-3. The change in failure probability from the nominal case to the current case was approximately 2E-3.

Fires: The analyst obtained the fire initiating event frequency for Fire Area 34 from the licensee. The frequency was 1.4E-3 per year. The analyst noted that this included the entire large fire area. The equipment of interest occupied less than 10 percent of this area. Therefore, the analyst reduced the fire initiation frequency to 1.4E-4 per year.

The bounding change to the core damage frequency for fires was therefore:

$\text{Delta-CDF}_{\text{fires}}$ = 2E-3 * 1.4E-4/year = 2.8E-7/yr

This value was conservative because the analyst provided no credit for suppression of a fire before it affected all four safety related ventilation fans.

Common cause failures: The second contributor to core damage frequency involved the common cause failure of all four ventilation fans. The SPAR model included basic

events for common cause fan failures. SWG-FAN-CF-SFRUN included a failure probability of 1.7E-6. This was the common cause failure probability of all the fans in a 24-hour period. To convert this to an annual common cause failure rate, the analyst multiplied this value by 365. The result was a common cause failure probability of 6.2E-4.

Next, the analyst considered recovery of at least one of the failed fans. Ventilation fans are simple machines. It is highly likely that the licensee would recover at least one of the fans in the eight hour time frame (assuming that the manual action had already failed). The licensee would only need to recovery one of the four fans to avoid core damage. The analyst used judgment and assumed a fan non-recovery failure probability of 0.1.

Considering the human action failure probabilities discussed previously, the bounding change to the core damage frequency was:

Delta-$CDF_{common\ cause}$ = 2E-3 * 0.1 * 6.2E-4/year = 1.2E-7/yr

Total Risk: The overall change to the core damage frequency was:

Delta-CDF_{total} = 2.8E-7/yr + 1.2E-7/yr = 4.0E-7/yr

The most dominant sequences included fires in Fire Area 34, failure of the 480 Vac switchgear cooling and the failure of the manual action to restore cooling. The low frequency of applicable fires combined with the relatively low failure probability for the alternate cooling method helped to reduce the risk.

Large Early Release Frequency: To evaluate the change to the large early release frequency (LERF), the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." Diablo Canyon has a large dry containment. The finding screened as having very low safety significance for LERF because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories.

Because the delta-CDF was less than 1E-6 and the finding was not a significant contributor to the large early release frequency, the finding was of very low safety significance (Green).

The team determined the finding was of very low safety significance (Green), because it did not represent a loss of system safety function. The licensee has entered this finding into their corrective action program as DN-50570838 and DN-50572295. This finding had a human performance cross-cutting aspect associated with resources, because the licensee did not have adequate procedures and available facilities and equipment, including physical improvements, simulator fidelity and emergency facilities and equipment [H.2 (d)].

Enforcement. Technical Specification 5.4.1(a), "Procedures," requires that written procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, Revision 2, Appendix A. Regulatory Guide 1.33, "Quality Assurance Program," Appendix A, Section 5 requires procedures for Abnormal, Offnormal, or Alarm Conditions. Section 5 states, in part, that each annunciator should have its own written procedure, which should normally contain (1) the meaning of the

annunciator, (2) the source of the signal, (3) the immediate action that is to occur automatically, (4) the immediate operation action, and (5) the long-range actions. Contrary to the above, the licensee failed to establish, implement, and maintain procedures for annunciator response to provide temporary ventilation to several critical electrical equipment rooms. Specifically, as of July 11, 2013, Procedure CP M-10, "Fire Protection of Safe Shutdown Equipment," Revision 27, Attachment 7.8, "Temporary Ventilation for the Control Room, Inverter/Charger Rooms, and 480V Vital Switchgear Rooms and Charging Pump 1-3 Room," Section 4a, requires the use of two 24-inch diameter fans, which, if connected as directed, would not perform the function as prescribed by the procedure as the fans require more current than can be supplied from either the equipment room receptacles or from the alternate power source (temporary generator and distribution panel). This finding was entered into the licensee's corrective action program as Notifications DN-50570838 and DN-50572295. Because this finding was of very low safety significance and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with NRC Enforcement Policy: NCV 05000275/2013007-03 and 05000373/2013007-03, "Inadequate Procedures for Establishing Temporary Ventilation."

.2.15 Containment Hatch Seals

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, the current system health report, selected drawings, maintenance and test procedures, and corrective action documents associated with the containment hatch seals. With regards to LERF, the team reviewed the containment hatch seals based upon risk information in the event of failure of the hatch seals during a loss of coolant accident (LOCA). The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of the components in the system to perform their desired design basis functions. Specifically, the team reviewed:

- Equipment qualification packages to ensure the seals were qualified to perform in a LOCA environment without a material property change
- Component design criteria and health reports
- Recent visual inspection results of the containment hatch seals to ensure they maintain their resiliency
- Containment leak rate test results for the hatches, and comparisons to the allowable leak rate
- Previous operability determinations to ensure that affected equipment could satisfy applicable design requirements

b. Findings

No findings of significance were identified.

.2.16 Containment Purge Valves

a. Inspection Scope

The team reviewed the updated safety analysis report, design basis documents, the current system health report, selected drawings, maintenance and test procedures, and corrective action documents associated with the containment purge valves. With regards to LERF, the team reviewed the containment purge valves based upon risk information in the event of failure of the valves to close during a LOCA. The team also performed walkdowns and conducted interviews with system engineering personnel to ensure the capability of the components in the system to perform their desired design basis functions. Specifically, the team reviewed:

- Equipment qualification packages to ensure the seals were qualified to perform in a LOCA environment without a material property change
- Regulatory correspondences between Pacific Gas and Electric and the NRC during the licensing phase of Diablo Canyon Power Plant
- SER Revision 9 which imposed a 90 hour per year limit on operation of the purge system and vacuum/overpressure relief system
- Later correspondence with the NRC in which the limit was raised to 200 hours per year of operation. This operating limit applied to both the purge system and the vacuum/pressure relief system. This time restriction was to limit the probability of a LOCA occurring while the purging/relief is in operation
- Plant procedures and Technical Specifications to verify that the time limit for operating either of these systems was appropriately implemented.

b. Findings

No findings of significance were identified.

.3 Results of Reviews for Operating Experience

.3.1 Inspection of NRC Information Notice IN 2012-16, “Preconditioning of Pressure Switches before Surveillance Testing”

a. Inspection Scope

The team reviewed the licensee’s evaluation of Information Notice 2012-16 “Preconditioning of Pressure Switches before Surveillance Testing,” to verify that the review adequately addressed the industry operating experience issues in the Information Notice.

b. Findings

No findings of significance were identified.

.3.2 Inspection of Industry Operating Experience Regarding Westinghouse Technical Bulletin TB-09-4, "Impact of Auxiliary Pump Heat on Westinghouse and Combustion Engineering Analysis/Methodologies"

a. Inspection Scope

The team reviewed the licensee's evaluation and response to Westinghouse Technical Bulletin TB-09-4 concerning, "Impact of Auxiliary Pump Heat on Westinghouse and Combustion Engineering Analysis/Methodologies," to confirm that the evaluation adequately addressed the associated industry operating experience. The team reviewed the licensee's response to this issue documented in Notification DN-50232371 which established that the Condensate Storage Tanks for both Units have adequate margin to account for the heat load imparted from the auxiliary feedwater pumps during both normal and accident conditions. Based on the results of these reviews, the team determined that the licensee's evaluation adequately addressed the conditions identified in the industry operating experience report.

b. Findings

No findings of significance were identified.

.3.3 Inspection of NRC Generic Letter 89-10 "Motor-Operated Valve Testing and Surveillance," as applied to Auxiliary Feedwater Pump Discharge Valves

a. Inspection Scope

The team reviewed the licensee's response to Industry Operating Experience (OE) 28528 concerning "Auxiliary Feedwater Pump Discharge to Steam Generator Isolation Motor Operated Valve Failure to Close" to confirm that the evaluation adequately addressed the associated industry operating experience. The team reviewed the licensee's response to this issue documented in Notification DN-50228971 which confirmed that appropriate preventive maintenance activities consistent with the guidance provided in Generic Letter 89-10, "Motor-Operated Valve Testing and Surveillance" were being implemented. Based on the results of these reviews, the team determined that the licensee's evaluation adequately addressed the conditions identified in the industry operating experience report.

b. Findings

No findings of significance were identified.

.3.4 Inspection of NRC Information Notice 2005-11, "Internal Flooding/Spray-Down of Safety-related Equipment due to Unsealed Equipment Hatch Floor Plugs and/or Blocked Floor Drains"

a. Inspection Scope

The team reviewed the licensee's actions regarding the review of NRC Information Notice 2005-11, "Internal Flooding/Spray-Down of Safety-related Equipment due to Unsealed Equipment Hatch Floor Plugs and/or Blocked Floor Drains." This notice was issued to inform licensees of the possibility of flooding safety-related equipment as a result of (1) equipment hatch floor plugs that are not water tight and (2) blockage of the equipment floor drain systems that are credited to mitigate the effects of flooding. The team reviewed Action Request A0638978, which included the results of walkdowns performed by the licensee to inspect equipment hatches and floor drains. The action request stated that all hatches and floor drains in safety-related equipment areas were reviewed for applicability, and found to be in accordance with design documents. The hatches were sealed, and floor drains were in programs to verify they were not obstructed.

b. Findings

No findings of significance were identified.

.4 Results of Reviews for Operator Actions

The inspectors selected risk-significant components and operator actions for review using information contained in the licensee's probabilistic risk assessment. This included components and operator actions that had a risk achievement worth factor greater than two or Birnbaum value greater than 1E-6.

a. Inspection Scope

For the review of operator actions, the inspectors observed operators during simulator scenarios associated with the selected components as well as observing simulated actions in the plant.

The selected operator actions were:

- Transfer to cold leg recirculation after the refueling water storage tank level reaches its low level setpoint following a large break LOCA (Scenario) with one residual heat removal residual heat removal pump failing to trip on low refueling water storage tank level (Job Performance Measure)

- Initiate cooling to the residual heat removal Heat Exchangers Following a small break LOCA (Scenario)

- Manually open auxiliary saltwater cross tie valve FCV-601 on a station blackout to utilize the auxiliary saltwater pump from the other unit (Scenario)

- Crosstie fuel oil headers when the emergency diesel generator day tank hits the low level with no transfer pump available on the applicable unit (Job Performance Measure)

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed condition reports associated with the selected components, operator actions and operating experience notifications.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On July 11, 2013, the team leader presented the results to Mr. B. Allen, Site Vice President, and other members of the licensee's staff. The licensee acknowledged the findings during the meeting. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

4OA7 Licensee Identified Violations

No findings were identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Allen, Site Vice President
J. Bailey, Supervisor, Engineering
S. Baker, Manager, Design Engineering
T. Baldwin, Manager, Regulatory Services
N. Barber, Engineer
A. Bates, Director, Engineering
E. Brackeen, Engineer
G. Close, Director, Site Services
J. Cook, Engineer
T. Cuddy, Senior Manager, Communications
M. Culala, Acting Director, Quality Verification
S. Dunlap, Supervisor, Engineering
J. Fields, Quality Verification
M. Frauenheim, Manager, Problem Identification
B. Giffrow, Supervisor, Site Services
D. Hampshire, Fire Protection Supervisor
D. Hantman, Engineer
C. Harrison, Engineer
T. Juarez, System Engineer
W. Landreth, Engineer, Regulatory Services
J. Lyle, Operations Training Manager
M. McCoy, Engineer, Regulatory Services
K. Millenaar, Engineer
A. Moarefy, Engineer
A. Montoya, Supervisor, Engineering
E. Nelson, Senior Manager, Licensing Basis Verification Project
J. Nimick, Director, Operations Services
R. Ortega, Engineer
D. Overland, Senior Engineer, Regulatory Services
M. Pribbe, Director, Security Services
R. Robins, Auditor, Quality Verification
P. Soenen, Supervisor, Regulatory Services
J. Summy, Director, Engineering
E. Tahlman, Senior Engineer, Engineering
R. Waltos, Supervisor, Engineering
J. Whetsler, Operations
M. Winsor, Manager, Engineering

NRC Personnel

T. Hipschman, Senior Resident Inspector
G. Replogle, Senior Reactor Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000275; 05000373/2013007-01	NCV	Failure to Evaluate the Effects on the Emergency Diesel Generator Load Capability for Maximum Combustion Air Temperature Conditions (1R21.2.4)
05000275; 05000373/2013007-02	NCV	Failure to Evaluate the Auxiliary Feedwater Pump Motor Capability for the Effects of Pump Maximum Brake Horsepower Conditions (1R21.2.4)
05000275; 05000373/2013007-03	NCV	Inadequate Procedures for Establishing Temporary Ventilation (1R21.2.14)

LIST OF DOCUMENTS REVIEWED

Calculations

NUMBER	TITLE	REVISION
235A-DC	Battery 11 Sizing, Voltage Drop, Short Circuit & Charger Sizing Calculation	11
9*19170 (STA-061)	FSAR Table 6.3-5 Update, Safety Injection to Recirculation Mode; Sequence and Timing of Manual Changeover	5
361-DC	125 VDC Ground detection System Sensitivity	0
230-DC	Under and Overvoltage Relay Settings for Class 1E 125 VDC Systems Units 1 and 2	0
363-DC	Unit 1 Electrical Penetration Protection Calculation	5
369-DC	Units 1 and 2 System 67, 125 VDC Class 1E Vital 125 VDC System Calculation for PRA System Analysis (Station Blackout)	1
EQP 230.1	Unit 1 and Unit 2 Station Battery Racks, Elevation 115’-0”, Auxiliary Building	5
093-DC	120VAC Vital Instrument Power Panels	17
360-DC	125 VDC System Analysis Methodology & Scenario Development	3

NUMBER	TITLE	REVISION
015-DC	Diesel Generator Loading for Vital Bus Loads Units 1 and 2	22
M-1141	Maximum Emergency Diesel Generator Mechanical Loading	1
93C-DC	Vital UPS System Calc – Breaker & Cable Sizing, Voltage Drop, Short Circuit & Breaker Coordination	1
333B-DC	Unit 2 Class 1E Fuses in Vital Instrument AC Circuits	1
333C-DC	Unit 1 Class 1E Fuses in Vital Instrument AC Circuits	0
114-DC	Protection Relay Settings for Bus and Feeders	8
9*22408	Guidelines for Transformer Data Entered Into SAP	8
9000037760-20	Diesel Generator Loading for Vital Bus Loads Unit 1 and 2	20
9000033359-13	12kV/4kV/480V Electrical Distribution System	13
65-T-232	Evaluation of Concrete Shear Wall on Column Line 31 for Hosgri Loading	5
72.5.5	Summary of Hosgri Demands for Shear Walls 17, 19, 31, & G	0
M-270	Auxiliary Salt Water Pump Vault Drainage System	6
52.18.10	Intake-Evaluation of ASW Pump Vault and Vent Shaft	4
52.18.11	Qualification Of The ASW Pump Base And Modification Of The ASW Access Manholes Intake- Development of Wave Action Design Loads for DCM T-5	0
M-953	Determination if Adequate Net Positive Suction Head is Available for One Pump Supplying 2 Heat Exchangers	4
M-912	Heating Ventilation and Air Conditioning Interactions for Safe Shutdown-Room Heatup Due to Loss of Heating Ventilation and Air Conditioning	6
EQP 230.3	Structure-Battery Rack	3

NUMBER	TITLE	REVISION
M-826	Auxiliary Feedwater Pump Net Positive Suction Head	3
STA-40	Auxiliary Feedwater Flow Rate Impact on Steam Generator Tube Rupture Overfill Margin	1
STA-135	Auxiliary Feedwater Pump Acceptance Curves	3
STA-172	Recirculation Orifice for Motor Driven Auxiliary Feedwater Pump 2-2	0
M-0966	Maximum Component Cooling Water Flow to Residual Heat Removal Heat Exchangers	1
M-305	Component Cooling Water Temperature and Pressure for Operating Modes	25
DC663217-117	Increase in Design Temperature for Shell Side of Diablo Canyon Residual Heat Exchanger	1

Procedures

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ECA 0.0	Loss of All Vital AC Power	29
ECA 0.1	Loss of All AC Power Recovery Without SI Required	20
ECA 0.2	Loss of All AC Power With SI Required	15
OP AOP-10	Loss of Auxiliary Salt Water	10
OP AOP-11	Malfunction of Component Cooling Water System	29
EOP E-0	Reactor Trip or Safety Injection	43
EOP E-1	Loss of Reactor or Secondary Coolant	32
EOP E-1.3	Transfer to Cold Leg Recirculation	11
AD2.ID1	Procedure Use and Adherence	21
AR PK16-07	Diesel 11 Fuel Oil System	13

NUMBER	TITLE	REVISION/DATE
OP J-6C: I	Diesel Fuel Oil Transfer System – Make Available and Place in Service	14
OM6.ID3	Confined Space Safety Program	10A
EOP E-1.3	Unit 2 Transfer to Cold Leg Recirculation	20
EOP E-1.3	Unit 1 Transfer to Cold Leg Recirculation	29
MP E-67.3C	Unit 1 and Unit 2 Maintenance of Solidstate Controls 400A Vital Station Battery Chargers	8
MP E-65.1A	Unit 1 and Unit 2 Maintenance and Overhaul of Solidstate Controls 20 kVA UPS	36
MP I-8-F155	RCP 1-1 #1 Seal Return Flow Channel FIT-159 Calibration	1
STP M-8B	Leak Rate Testing of Electrical Penetrations (Unit 2)	6
STP M-8B	Leak Rate Testing of Electrical Penetrations (Unit 2)	8
STP M-8B	Leak Rate Testing of Electrical Penetrations (Unit 1)	16
STP M-8B	Leak Rate Testing of Electrical Penetrations (Unit 1)	17
STP M-8B	Leak Rate Testing of Electrical Penetrations (Unit 1)	19
MP E-58.5	Re-Pressurization of Containment Electrical Penetrations (Unit 1 and Unit 2)	12
MP E-45.1	Electrical Penetration Repair (Unit 1 and Unit 2)	5
MP E-57.4	EQ Maintenance and Survey of Containment Penetrations, Cable and Splices (Unit 1 and Unit 2)	15
STP M-83A	Penetration Overcurrent Protection	29A
STP M-83B	Penetration Conductor Overcurrent Protection Maintenance	22A
MP E-67.6	Unit 1 and Unit 2 Station Battery Preventive Maintenance	12

NUMBER	TITLE	REVISION/DATE
STP M-12A	Unit 1 and Unit 2 Vital Station Battery Modified Performance Test	16
STP M-11D	Station Battery Terminal voltage and Float Current Monitoring	3
STP M-11C	Terminal Resistance Measurement and Inspection for Vital Batteries	17
STP M-11B	Unit 1 and Unit 2 Station Battery Condition Monitoring	31
STP M-11A	Unit 1 and Unit 2 Station Battery and Pilot Cell Condition Monitoring	26
AD13.DC10	Battery Monitoring and Maintenance Program	1
STP P-RHR-ST	Unit 1 and 2 Test of RHR Pump Trip from RWST level Channels	1
STP P-RHR-ST	Unit 1 and 2 Test of RHR Pump Trip from RWST level Channels	2
STP P-RHR-ST	Unit 1 and 2 Test of RHR Pump Trip from RWST level Channels	3
STP I-9-L921	Unit 1 Refueling Water Storage Tank Level Channel LT-921 Calibration	11A
STP I-9-L922	Unit 1 Refueling Water Storage Tank Level Channel LT-922 Calibration	11
STP I-9-L921	Unit 1 Refueling Water Storage Tank Level Channel LT-921 Calibration	13
STP I-9-L920.A	Unit 1 Refueling Water Storage Tank Level Channels L920, L921 and L922 COT	5
STP I-9-L920	Unit 2 Refueling Water Storage Tank Level Channel LT-920 Calibration	8A
STP I-9-L920.A	Unit 2 Refueling Water Storage Tank Channels L920, L921 and L922 COT	9
STP M-12B	BTC11 Performance Test	December 29, 2011

NUMBER	TITLE	REVISION/DATE
STP M-12B	BTC11 Performance Test	February 22, 2010
STP M-12B	BTC11 Performance Test	March 24, 2008
MA1.DC60	Unit 1 and Unit 2 Electrolytic Capacitor Program	0
MP I-2.29-1	Unit 1 and Unit 2 Capacitor Capacitance and Leakage Testing	8
TP TB-12004	Vital Area Ventilation – Portable Generator Acceptance Test	0
CP M-10	Unit 1 Fire Protection of Safe Shutdown Equipment	27
CP M-10	Unit 1 Fire Protection of Safe Shutdown Equipment	28
CP M-10	Unit 1 Fire Protection of Safe Shutdown Equipment	29
ECG 23.6	480 VAC Class 1 Switchgear Ventilation System	3A
AR PK15-09	Electrical Rooms Temperature Monitor	28
AR PK15-19	ESF 480 V/DC Rooms Ventilation Trouble	9
OM7.ID11	10 CFR Part 21 Reportability Review Process	4
OM4.ID3	Operating Experience Program	23
CY1.ID2	Closed Cooling Water Chemistry Program	2
OP F-5:1	Chemistry Control Limits and Action Guidelines for the Primary Systems	39
OP F-5:III	Chemistry Control Limits and Action Guidelines for Plant Support Systems	27
AR PK17-22	480V Bus 1G	16
AR PK16-22	480V Bus 1H	17
AR PK16-22	480V Bus 2H	12
AR PK17-22	480V Bus 2G	11

NUMBER	TITLE	REVISION/DATE
AR PK19-18	Vital UPS Trouble	7
MP E-65.1A	Maintenance and Overhaul of Solidstate Controls 20KVA/UPS	36
STP M-9A	Diesel Engine Generator Routine Surveillance Test	119
STP M-9G	Diesel Generator 24-Hour Load Test and Hot Restart Test	49
OP J-7B	480V Vital System	8
OP J-7B:I	480V Vital System – Prepare for Service and Energize	16
OP J-7B:VI	480V Vital System – Ground Isolation and Ground Detection System	0
AR PK19-19	Vital UPS Failure	5
MP E-65.1A	Maintenance and Overhaul of Solidstate Controls 20kVA UPS	36
AWP E-016	Inspection Guide – Maintenance Rule & License Renewal Structural Monitoring Programs – Civil	6
CP M-5	Response to Tsunami Warning	3
STP V-18M	Check Valve Inspections	10
STP M-8C1	Leak Rate Testing of the Equipment Hatch Seal	7
STP V-662	Penetration 62 Containment Isolation Valve Leak Test	8
STP V-3T7	Exercising Containment Ventilation Isolation Valves FCV-660, 661, RCV-11, 12	2
MP M-51.10	Installation and Adjustment of T-Ring on RCV-11, 12 and FCV 660, 661	13
CP M-10	Attachment 7.3, Fire Protection of Safe Shutdown Equipment	November 26, 2012
AR PK15-09	Electrical Room Temp. Monitor	28

NUMBER	TITLE	REVISION/DATE
ECG 23.6	480V Class 1 Switchgear Vent System	3A
M 70C	Inspect/Maintain Auxiliary Salt Water Pump 1-1 Door	January 21, 2010

Drawings

NUMBER	TITLE	REVISION/ DATE
663032-1	Flood Doors	B
663075-568	Personnel Hatch	B
663075-559	Emergency Hatch	B
663075-723	Equipment Hatch	H
437636 Sheet 1	Electrical Schematic-Ventilation Fan Motors	20
663174-1	Outline Drawing for RCV-11	4
663174-2	Outline Drawing for FCV-660	6
108032, Sheet 47B	Instrument Schematic for Containment Purge Valve	11
516117	Unit 2 RCV-11	5
501389	Unit 1 RCV-11 and FCV-660	17
663075-923	General Arrangement: Personnel Air Lock	2
102023, Sheet 13	Vent Drawing-480VAC Switchgear. Room Supply and Exhaust	104
102023, Sheet 14	Vent Drawing-480VAC Switchgear. Room Supply and Exhaust	91
6011479-389	ASW Vault Drain Check Valve	2
500964	Unit 2 Equipment Location Plan at Elevation 85’ – 0” Turbine Building	33

NUMBER	TITLE	REVISION/ DATE
500965	Unit 2 Equipment Location Plan at Elevation 104’ – 0” Turbine Building	14
500966	Unit 2 Equipment Location Plan at Elevation 119’ – 0” Turbine Building	15
463661	Units 1 & 2 Structural Modifications Concrete Shear Wall Lines 19 & 31	9
498524	Unit 2 Turbine Building Concrete Plans & Details at Elev. 85’ – 0” Diesel Generator Room 2-3	6
437915	Diagram of Connections Distribution Panel 11,12,13 & 14	45
498033	Schematic Diagram Solid State Protection System AC Power Distribution	9
437916	Single Line Meter and Relay Diagram 480 Volt System Bus Section 1F	46
437667	Schematic Diagram 4KV Diesel Generator Control	45
437668	Schematic Diagram 4KV Diesel Generator Control No. 13	39
437666	Schematic Diagram 4KV Diesel Generators and Associated Circuit Breakers	30
437533	Single Line Meter & Relay Diagram 4160 Volt System	41
663536, Sheet 18	Wiring Diagram ASL and ASL-R Transformers	4
437629	Schematic Diagram Motor Control Center Transformer	14
663336, Sheet 12	1F, 1G & 1H Control Center Drawings Motor Control Center	12
663336, Sheet 6	1F, 1G & 1H Control Center Drawings Motor Control Center	5
445290	Single Line Meter and Relay Diagram 120V Instrument AC System	15

NUMBER	TITLE	REVISION/ DATE
437546	Single Line Meter and Relay Diagram 125 Volt DC System	44
502110	Single Line Diagram 500/230/25/12/4.16 KV Systems	19
102003, Sheet 1	Unit 1 Motor Driven Auxiliary Feedwater Pumps	64
102003, Sheet 4	Unit 1 Motor Driven Auxiliary Feedwater Pumps	76
102003, Sheet 6	Unit 1 Motor Driven Auxiliary Feedwater Pumps	28
102004, Sheet 1	Unit 1 Turbine Driven Auxiliary Feedwater Pump	88
102004, Sheet 2	Unit 1 Turbine Driven Auxiliary Feedwater Pump	54
102004, Sheet 3	Unit 1 Turbine Driven Auxiliary Feedwater Pump	104
102004, Sheet 5	Unit 1 Turbine Driven Auxiliary Feedwater Pump	114
108003, Sheet 1	Unit 2 Motor Driven Auxiliary Feedwater Pumps	50
108003, Sheet 4	Unit 2 Motor Driven Auxiliary Feedwater Pumps	62
108003, Sheet 6	Unit 2 Motor Driven Auxiliary Feedwater Pumps	10
108004, Sheet 1	Unit 2 Turbine Driven Auxiliary Feedwater Pump	74
108004, Sheet 2	Unit 2 Turbine Driven Auxiliary Feedwater Pump	35
108004, Sheet 3	Unit 2 Turbine Driven Auxiliary Feedwater Pump	85
108004, Sheet 5	Unit 2 Turbine Driven Auxiliary Feedwater Pump	98
108010, Sheet 1	Residual Heat Removal System	18
108010, Sheet 3	Residual Heat Removal System	29
102010, Sheet 1	Residual Heat Removal System	34
102010, Sheet 3	Residual Heat Removal System	49
DC-663217-110-1	Residual Heat Removal Heat Exchanger Tube Sheet Bundle Layout	January 27, 1995

NUMBER	TITLE	REVISION/ DATE
DC-663217-111-1	Residual Heat Removal Heat Exchanger Detailed Tube Sheet Bundle Layout	January 27, 1995
437546	Unit 1 Single Line Meter and Relay Diagram 125 Volt DC System	44
445295	Unit 2 Single Line Meter and Relay Diagram 125 Volt and 250 Volt DC System	13
441240	Unit 2 Single Line Meter and Relay Diagram 125 Volt DC System	29
437916	Unit 1 Single Line Meter and Relay Diagram 480 Volt System Bus Section 1F	46
441237	Unit Single Line Meter and Relay Diagram 480 Volt System Bus Section 2F	35
437542	Unit 1 Single Line Meter and Relay Diagram 480 Volt System Bus Section 1G	54
441238	Unit 2 Single Line Meter and Relay Diagram 480 Volt System Bus Section 2G	49
437543	Unit 1 Single Line Meter and Relay Diagram 480 Volt System Bus Section H	50
441239	Unit 2 Single Line Meter and Relay Diagram 480 Volt System Bus Section 2H	45
437537	Unit 1 Single Line Meter and Relay Diagram 480 Volt System Bus Sections 11D and 11E	60
437533	Unit 1 Single Line Diagram Single Line Meter and Relay Diagram 4160 Volt System	41
437532	Unit 1 Single Line Meter and Relay Diagram 4160 Volt System	28
441228	Unit 2 Single Line Diagram Single Line Meter and Relay Diagram 4160 Volt System Bus Section “D” and “E”	16
441229	Unit 2 Single Line Meter and Relay Diagram 4160 Volt System Bus Section “F” DG 23	18

NUMBER	TITLE	REVISION/ DATE
441230	Unit 2 Single Line Meter and Relay Diagram 4160 Volt System Bus Section “G” and “H” DG 21 and DG 22	28
67515	Main AC Terminal Box Containing 3 JCB 3 Current Transformers & Customers Take Off Lugs	1
496291	Electrical Diagram of Connections Diesel Generator and Associated Equipment	3
441385	Electrical Diagram of Connections Diesel Generator and Associated Equipment	22
496275	Electrical Schematic Diagram 4160V Diesel Generator No. 23 and Associated Circuit Breaker	8
441355	Electrical Schematic Diagram 4kV Diesel Generators and Associated Circuit Breakers DG 21 and 22	24
437546	Unit 1 Single Line Meter and Relay Diagram 125 Volt DC System	44
445075	Unit 1 Single Line Meter and Relay Diagram 125 Volt DC System	18
495396	Unit 1 Single Line Meter and Relay Diagram 125 Volt DC System	4
445076	Unit 1 Single Line Meter and Relay Diagram 125 Volt DC System	17
445295	Unit 2 Single Line Meter and Relay Diagram 125 Volt and 250 Volt DC System	13
495399	Unit 2 Single Line Meter and Relay Diagram 125 Volt Instrument System	7
441240	Unit 2 Single Line Meter and Relay Diagram 125 Volt DC System	39
500603	Unit 2 Arrangement and Details Containment Electrical Penetration Pipe Sleeves	8
663344	AMETEK 400 Amp Battery Charger Front Panels/Terminal Channels	2

NUMBER	TITLE	REVISION/ DATE
20-109298	AMETEK Schematic – Production 400 Amp Battery Charger 480 VAC 3 phase 60 HZ 135 VDC	D
20-109299	AMETEK Schematic – Production 400 Amp Battery Charger Alarms 135 VDC	F
10-107195	Outline – Production AMETEK 400 Amp Battery Charger 480 VAC 3 Phase 60 HZ 135 VDC	G
10-107375	AMETEK Outline Mimic Panel 400 Amp Battery Charger	C
K07569	C&D Technologies, Inc. Outline, LCUN Battery Cell	6
J-8477-5	C&D Technologies, Inc. Outline, LCU-13 to LCU-27 Plate Battery	5
216154	Unit 1 and Unit 2 Modifications to One Tier Battery rack for LCU-27 Batteries	4
516103	Unit 1 and Unit 2 Mechanical Flow Diagrams	14

Condition Reports

DN50302617	DN50568856	DA50569373	DN50041462	DN50041502
DN50082487	DN50277680	DA50558837	DN50559745	DA50568695
DA50568695	DN50377378	DN50544431	DN50568783	DN50435410
DN50283733	DN50510582	DN50359818	DN50513874	DN50429607
DN50202655	DN50500561	DN50291040	DN50513872	DN50429638
DN50163273	DN50494320	DN50442467	DN50513876	DN50403163
DN50087251	DN50368821	DN50372772	DN50378415	DN50366278
DN50534757	DN50358757	DN50499634	DN50380487	DN50488842
DN50493218	DN50482220	DN50419593	DN50464432	DN50303327
DN50247177	DN50232371	DN50408898	DN50390088	DN50296503
DN50241518	DN50228971	DN50391867	DN50310039	DN50262494
DN50237220	DN50412221	DN50390347	DN50040112	DN50486039
DN50355059	DN50366899	DN50366899	DN50311497	DN50482738
DN50302276	DN50285642	DN50428643	DN50066443	DN50066448
DN50475420	DN50509931	DN50517492	DN50517234	DN50307598
DN50240166	DN50307838	DN50571632	DN50475232	DN50200935
DN50126565	DN50528628	DN50387851	DA0678029	DA0614550
DN50553121				

Condition Reports Generated During the Inspection

DN50569482	DN50572850	DN50573049	DN50572768	DN50571632
DN50571017	DN50570764	DN50568026	DN50568368	DN50568448
DN50568646	DN50568647	DN50568648	DN50568649	DN50568649
DN50568661	DN50570588	DN50570838	DN50568016	DN50568400
DN50568281	DA50568508	DN50568282	DA50568509	DN50568283
DA50568560	DN50568500	DA50568695	DN50568529	DN50568651
DA50568762	DN50568652	DA50568761	DN50568653	DA50568760
DN50568654	DA50568698	DN50568792	DA50568942	DN50568811
DN50568812	DN50568813	DN50568814	DN50568815	DN50568816
DN50568928	DN50569695	DA50571639	DN50571092	DN50570635
DA50570755	DN50570645	DN50570646	DN50570647	DN50570648
DN50572295	DN50573018	DN50572773		

Work Orders

64027186	64007321	64007322	64033380	64007317
68001705	68017060	64019320	64018603	64004894
64003231	68020709	68017059	64019317	64003230
64004893	68000754	68020708	68017058	64019313
64021695	64004892	64003229	64089196	64090120
64085870	64085865	64082791	64082786	60049740
60033915	60031559	60039298	60033911	60033916
60047080	60036427	60033912	60033917	60046850
60034312	60033918	60041926	64021011	60033914
60033914	60039406	64021013	64009159	64037286
64009137	64014578	64008733	64014296	64009141
64014582	64003446	64008230	64009137	64003102
64020558	61051092	64003188	64064153	64062895
64037266	64037310	64037277	64037320	64037266
64037310	64037277	64037320	64052443	R0232602-01

Miscellaneous

NUMBER	TITLE	REVISION/ DATE
1014800	EPRI Report, Plant Support Engineering: Elastomer Handbook for Nuclear Power Plants	August, 2007
RPE C-0001	EQ File-Containment Hatch Seal O-Rings	3
663174-25	Instruction Manual for Fisher 9220 Valve Assembly	10
Report A-253	An Evaluation of Tsunami Potential at Diablo Canyon Site (Including Supplements 1 and 2)	October, 1967

NUMBER	TITLE	REVISION/ DATE
DCM T-9	Wind, Tornado and Tsunami	13A
DCM T-9	Structural Design of the Intake Structure	12
	Concrete Crack Maps for Turbine Building Shear Wall on Column Line 31	3
6009838-204-1	General Electric Type AM-4.10 SF6 Conversion	February 27, 1996
663082-80-25	Ross Operating Valve Company Solenoid Pilot Operated – Inline Mounted	103
663336-8-1	Westinghouse Electric Corporation Transformer Test Data Sheet	March 19, 1970
43026-1	Solidstate Controls, Inc. Test Procedure Addendum Test Procedure No. 43026, Test Report 43026-	March 26, 1993
6013738-1	Operation – Maintenance Instructions for 1 Phase 20KVA UPS with Regulating Rectifier	14
663231-161	Power and Input/Output Requirements of SSPS Equipment	6
14078101-LR-012-0	Licensing Basis Verification Project Report	December 20, 2012
NCR DC0-92-EN-N032	Limitorque Operating Lever Declutching	0
P-RR3	IST Relief Request 3rd 10-year Interval	January 30, 2006
DCL-11-072	License Amendment Request 11-06, Revision to Technical Specification 3.3.5. "Loss of Power Diesel Generator Start Instrumentation"	October 24, 2011
663081-92	Operations and Maintenance Instructions for Electrical Penetrations 238X600NXG1	9
663081-218	Installation and Maintenance Manual for Electric Penetrations Assemblies	6

NUMBER	TITLE	REVISION/ DATE
663081-232	Installation and Maintenance Manual for Electric Penetrations Assemblies and Feed-through Kits	2
663344-86	AMETEK Solidstate Controls Instruction/Technical Manual	3
663343-80	C&D Charter Power Systems Installation and Operating of LCUN-33 Battery	6
663081-19	Electrical Penetration Assemblies Prototype Testing Qualification Report	March 16, 1970
663081-219	Conax IPS -580 Design Qualification Report for electric Penetration Assemblies for Diablo canyon Unit 1	February 21, 1984
663081-233	Conax IPS 1591 Design Qualification Report for Instrumentation Electric Penetration Assemblies	May 21, 1991
RS02098	C&D Technologies Power Solutions Standby Battery Rack Assembly Instructions	October 2011