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February 2, 2015

PG&E Letter DCL-15-015

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.73

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Supplemental Licensee Event Report 1-2014-003-02, Unanalyzed Condition Affecting Units 1 and 2 Emergency Diesel Generators, Tornado Missiles

Dear Commissioners and Staff:

Pacific Gas and Electric Company (PG&E) submits the enclosed Supplemental Licensee Event Report (LER) for an unanalyzed condition that affected Units 1 and 2 emergency diesel generators. PG&E is submitting this LER in accordance with 10 CFR 50.73(a)(2)(ii)(B) and 10 CFR 50.73(a)(2)(v).

This supplement updates the LER to include the extent of condition review and adds reporting criteria 10 CFR 50.73(a)(2)(v)(B) through (D).

PG&E will implement corrective actions in accordance with the Diablo Canyon Power Plant Corrective Action Program. PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this report.

This event did not adversely affect the health and safety of the public.

Sincerely,

Barry S. Allen

aph8/6470/50592094
Enclosure
cc\enc: Marc L. Dapas, NRC Region IV Administrator
Thomas R. Hipschman, NRC Senior Resident Inspector
Siva P. Lingam, NRR Project Manager
INPO
Diablo Distribution

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

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4. TITLE

Unanalyzed Condition Affecting Unit 1 and 2 Emergency Diesel Generators, Tornado Missiles

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	06	2014	2014	003	02	02	02	2015	Diablo Canyon Power Plant Unit 2	05000 323
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
5	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
000	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☒ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☒ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Joe Loya, Supervisor, Regulatory Services	805-545-4486

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On March 6, 2014, at 09:06 PST, with Diablo Canyon Power Plant (DCPP) Unit 1 in Mode 5 and Unit 2 in Mode 1 at 100 percent power, DCPP concluded the Unit 1 and Unit 2 emergency diesel generators (EDGs) radiator ventilation exhaust plenums were not sufficiently analyzed for tornado missiles. Additionally, DCPP identified that the EDGs engine exhaust pipes were not protected from tornado missiles. DCPP staff performed an operability assessment and concluded the EDGs remained operable. On March 6, 2014, at 16:33 PST, DCPP made an 8-hour, nonemergency report to the NRC (Event Notification 49879) per 10 CFR 50.72(b)(3)(ii)(B), "Unanalyzed Condition." During review of extent of condition this issue was determined to affect the ventilation systems associated with Unit 1 and Unit 2 480 V AC switchgear and battery/inverter equipment. Event Notification 49879 was updated on September 9, 2014, at 19:45 PDT.

The cause was due to a misunderstanding of the DCPP tornado missile protection licensing basis. DCPP incorrectly extended the NRC approval of limited tornado protection exceptions to the EDG ventilation system redesign and modification. Corrective actions included retraining and requalifying all employees who perform 10 CFR 50.59 screens and evaluations including commissioning a Licensing Basis Verification Project to ensure the Current Licensing Basis is clear and to correct deficient 10 CFR 50.59 evaluations. DCPP is evaluating tornado missile risk using a probabilistic technique and will be pursuing a change to the tornado missile licensing basis via license amendment request.

NARRATIVE

I. Reportable Event Classification

This event is reportable pursuant to the following criteria:

- 10 CFR 50.73(a)(2)(ii)(B), "Any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety."
- 10 CFR 50.73(a)(2)(v)(A-D), "Any event or condition that could have prevented the fulfillment of the safety function."

II. Plant Conditions

Diablo Canyon Power Plant (DCPP) Unit 1 was in Mode 5 for refueling, and Unit 2 was operating in Mode 1 at 100 percent reactor power, with normal operating reactor coolant temperature and pressure.

III. Problem Description

A. Background

DCPP Tornado Missile licensing basis considers three hypothetical missiles. A 108 lb board, a 76 lb schedule 40 pipe, and a 4,000 lb automobile. Additional site-specific tornado missiles, such as siding and pull box or hatch covers, are evaluated to determine if they are more severe than the three hypothetical missiles.

DCPP Units 1 and 2 each have three emergency diesel generators (EDGs) [DG] that provide vital backup power to three electrical buses [BU] to mitigate the consequences of a design basis accident (DBA) whenever normal or offsite power sources [EK] are unavailable. DCPP EDGs are designed to function so that a single failure of any EDG will not jeopardize the capability of the remaining EDGs to start and provide power to operate the shutdown systems required to mitigate any DBA condition.

The DCPP EDGs are cooled using engine-driven fans [FAN] that provide cooling air to the diesel generator radiators [HX]. The radiator fan draws air through the radiator, maintaining jacket water temperature and, in turn, maintaining lubricating oil temperature. Jacket water to the aftercooler also cools combustion air. The radiator fan also draws ambient air through the engine compartment to cool the equipment housed within it. Inability to maintain adequate radiator air flow due to postulated tornado missile deformation of the radiator exhaust vent plenum could result in higher component temperatures in the engine compartments, derating of the engine due to increased combustion air temperature, higher lubricating oil temperatures, and high cylinder jacket temperatures. The EDGs exhaust system is designed to direct engine exhaust to the atmosphere. The exhaust system consists of an exhaust silencer and exhaust piping. Deformation of the EDG exhaust system due to postulated tornado missiles could increase engine exhaust back pressure and impair the EDGs' operation.

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The Unit 1 and 2 480 V AC Switchgear and 125 V DC Inverter [INVT] Rooms Ventilation Systems limit the maximum ambient temperature in the 125 V DC inverter rooms and 480 V switchgear room [SWGR] and limit the maximum ambient temperature in the cable spreading room (CSR) when the Design Class II Cable Spreading Room Air Conditioning System is inoperable. The 480 V switchgear and inverter ventilation system supports the safety function of the 480 V switchgear, 125 V DC inverters, and CSR equipment by providing adequate cooling via forced ventilation flow. A postulated tornado missile damaging the supply and exhaust fans associated with the 480 V switchgear and inverter ventilation system could result in the inability of the system to meet its safety function.

B. Event Description

On March 6, 2014, at 09:06 PST, as part of the Licensing Basis Verification Project (LBVP), DCPP identified an unanalyzed condition where the EDG exhaust plenums and exhaust piping were not adequately protected from tornado missiles. This is a nonconforming condition with DCPP licensing basis requirements. On March 6, 2014, at 16:33 PST, DCPP reported this unanalyzed condition to the NRC, Event Notification 49879.

During the subsequent extent of condition review, a similar condition was identified, which affected the ventilation systems associated with Units 1 and 2 480 V AC switchgear and battery/inverter equipment. Event Notification 49879 was updated on September 9, 2014, at 19:45 PDT.

C. Status of Inoperable Structure, Systems, or Components That Contributed to the Event

This issue did not impact any plant equipment as no weather patterns capable of producing a tornado were forecast. DCPP has no recorded evidence of an onsite tornado.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

LBVP identified an incorrect methodology was used to determine tornado wind loading on the Emergency Diesel Generator Ventilation System (EDGVS) plenum. Subsequent questions from the NRC resident inspector prompted an evaluation of the DCPP licensing basis for tornado missiles. This evaluation identified that the licensing basis requirements for EDGVS and exhaust pipes require protection from tornado missiles.

F. Operator Actions

Operators verified that the EDGs were operable and no weather patterns capable of producing a tornado were forecast. Operators established shift orders that incorporated the following compensatory measures:

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1. Monitor the National Weather Service for a Tornado Watch on a three-hour periodicity.

2. Upon receipt of a Tornado Watch, remove or secure potential missile sources that are more severe than the design basis missiles.

3. Implement the DCPP "Hot Weather Plan" upon receipt of a Tornado Watch notification.

G. Safety System Responses

None.

IV. Cause of the Problem

PG&E has determined that the failure to include missile impactive loading in the 1995 redesign and modification of the EDGVS plenum was due to a misunderstanding of the DCPP tornado missile protection licensing basis. DCPP incorrectly extended the NRC approval of limited tornado protection exceptions to the EDGVS redesign and modification.

V. Assessment of Safety Consequences

DCPP performed a probabilistic risk assessment (PRA) and documented the results in a formal calculation (PRA Calculation SDP 14-01). This calculation was updated to include the 480 V AC Switchgear and 125 V DC Inverter Rooms Ventilation Systems as a result of the extent of condition review. With such low tornado frequencies at the site, it was concluded that tornado missile-initiated scenarios were insignificant contributors to the overall core damage frequency. The incremental core damage probability (ICDP) was less than the acceptance criteria of 1E-06. Since the risk contribution of the as-found condition was below the low risk significance guidance, this condition is of very low safety significance. Therefore, this condition has negligible impact to the health and safety of the public.

VI. Corrective Actions

A. Immediate Actions:

1. Potential missile sources which may be more severe than the hypothetical design basis missiles were either anchored in place or removed from the zone of influence.

2. Portable ventilation equipment was relocated to designated areas of the turbine building that are protected from tornado missiles to ensure there is an adequate inventory of backup ventilation equipment available following a tornado event to support the 480 V AC Switchgear and 125 V DC Inverter Rooms Ventilation Systems.

B. Other Corrective Actions

1. DCPP has retrained and requalified all employees who perform 10 CFR 50.59 screens and evaluations to ensure future changes to the facility are appropriately evaluated against licensing basis requirements.

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2. DCPP has commissioned a LBVP to ensure the Current Licensing Basis is clear and to identify deficient 10 CFR 50.59 evaluations.

3. DCPP is evaluating tornado missile risk using a probabilistic technique and will be pursuing a change to the tornado missile licensing basis via license amendment request.

4. In the event of a tornado watch affecting the DCPP site, standing orders have been put in place to secure or remove equipment which could be more severe than the hypothetical design basis missiles.

VII. Additional Information

None

A. Failed Components

None.

B. Previous Similar Events

"Licensee Event Report 1-2013-009-00, Unanalyzed Condition Affecting Unit 1 Emergency Diesel Generators," dated February 11, 2014, is similar to this event.

A. Industry Reports

None.