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PG&E Letter DCL-10-079

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

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyons Unit 1 & Unit 2
Licensee Event Report 1-2010-001-01
Common Cause Control Room Ventilation Radiation Detector Failures

Dear Commissioners and Staff:

Pacific Gas and Electric Company submits the enclosed revised licensee event report (LER) regarding common cause control room ventilation radiation detector failures from moisture intrusion. This revised LER updates the cause and corrective actions for this report and is submitted in accordance with 10 CFR 50.73(a)(2)(vii).

There are no new or revised regulatory commitments in this report.

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

Sincerely,

James R. Becker

swh/2246/50324604
Enclosure
cc/enc: Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Alan B. Wang, NRR Project Manager
INPO
Diablo Distribution

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Diablo Canyon Unit 1	05000275	1 OF 5

4. TITLE

Common Cause Control Room Ventilation Radiation Detector Failures

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
									Diablo Canyon Unit 2	05000323
10	13	2009	2010	- 001 -	01	08	27	2010	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☒ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Steven W. Hamilton – Senior Regulatory Services Engineer	(805) 545-3449

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
B	IL	RM	N305	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On October 13, 2009, 11:57 PDT, the combined Diablo Canyon Power Plant (DCPP) control room ventilation system (CRVS) transferred automatically to its pressurization mode of operation (mode 4) due to a high radiation signal from a system radiation monitor. On October 13, 2009, 12:26 PDT, radiation detector 1-RM-25 was found to be trending up and indicating 3 R/hr. Plant technicians removed this monitor from service upon verification of an invalid signal from the detector. On October 13, 2009, 14:42 PDT, radiation monitor 1-RM-26 was found to be trending up and was removed from service. On October 14, 2009, 0300 PDT, radiation monitor 2-RM-25 was found to be trending up and was removed from service.

On October 15, 2009, plant technicians determined the cause of the 1-RM-25 failure to be water intrusion. On December 24, 2009, plant technicians determined the cause of the 1-RM-26 failure to also be water intrusion. Water intrusion was caused by manufacturer workmanship flaws. Based on the above, it was concluded that a common mode failure had occurred and was reportable under 10 CFR 50.73(a)(2)(vii).

TEXT

I. Plant Conditions

The event date and times are identified below. For the discovery date, December 24, 2009, Unit 1 was in Mode 1 (Power Operation) at approximately 100 percent reactor power with normal operating reactor coolant temperature and pressure; Unit 2 was in Mode 1 (Power Operation) at approximately 100 percent reactor power with normal operating reactor coolant temperature and pressure.

II. Description of Problem

A. Background

The CRVS [VI] has four distinct modes of operation: mode 1: normal operation mode, mode 2: fire mode, mode 3: recirculation mode, and mode 4: pressurization mode. For the mode 4 - pressurization mode, the Control Room is pressurized with a remote source of air, to a minimum positive pressure, relative to all surrounding air spaces, to prevent the in-leakage of radioactive gases and particulates. CRVS mode 4 operations can occur from manual operation or automatic initiation on high radiation signal or engineered safety feature Phase 'A' Isolation.

Control room air supplies for both Units are monitored by four radiation monitors, 1-RM-25, 1-RM-26, 2-RM-25, and 2-RM-26. The safety function of these radiation monitors is to shift the CRVS to mode 4 on a high radiation alarm from any one of these detectors.

B. Event Description

On October 13, 2009, 11:57 PDT, the combined DCPP CRVS transferred to its pressurization mode of operation (mode 4) due to a high radiation signal from a system radiation monitor, 1-RM-25.

On October 13, 2009, 12:26 PDT, radiation monitor 1-RM-25 was found to be trending up and indicating 3 R/hr. Plant technicians removed this monitor from service upon verification of an invalid signal from the monitor.

On October 13, 2009, 14:42 PDT, radiation monitor 1-RM-26 was found to be trending up. Plant technicians removed this monitor from service upon verification of an invalid signal from the monitor.

TEXT

On October 14, 2009, 0300 PDT, radiation monitor 2-RM-25 was found to be trending up. Plant technicians removed this monitor from service upon verification of an invalid signal from the monitor.

On October 15, 2009, plant technicians determined the cause of the 1-RM-25 failure to be water intrusion.

On October 24, 2009, plant technicians completed the repairs of 1-RM-25, returning the Unit 1 train back to service.

On December 24, 2009, plant technicians determined the cause of the 1-RM-26 failure to be water intrusion, confirming a common mode failure, and also completed the repairs of 1-RM-26.

On January 2, 2010, plant technicians completed the repairs of 2-RM-25.

C. Status of Inoperable Structures, Systems, or Components that Contributed to the Event

None.

D. Other Systems or Secondary Functions Affected

No additional safety systems were adversely affected by this event.

E. Method of Discovery

Plant Technicians assigned to repair 1-RM-25 and 1-RM-26 replaced the affected components and determined the cause of the component failures to be water intrusion.

F. Operator Actions

None.

G. Safety System Responses

On October 13, 2009, 11:57 PDT, the combined DCPP CRVS transferred automatically to its pressurization mode of operation (mode 4) due to an invalid high radiation signal from a system radiation monitor 1-RM-25.

TEXT

III. Cause of the Problem

A. Immediate Cause

None

B. Cause

The cause of the failures was determined to be wind-driven water intrusion through barriers (o-rings) due to manufacturer workmanship flaws.

IV. Assessment of Safety Consequences

This event was reviewed against the reporting criteria of 10 CFR 50.73(a)(2)(vii) and found to be applicable. Under this regulation, "Any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to:

(A) Shut down the reactor and maintain it in a safe shutdown condition;
(B) Remove residual heat;
(C) Control the release of radioactive material; or
(D) Mitigate the consequences of an accident."

There were no safety consequences as a result of this event. The failure mode of the radiation detector placed the CRVS in a safe mode by activating the pressurization portion of the system and isolating the DCPP control room from external elements.

This event was reviewed to determine if it meets the criteria for a safety system functional failure. 10 CFR 50.73(a)(2)(vi) provides that "Events covered in paragraph (a)(2)(v) of this section may include one or more procedural personnel errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported pursuant to paragraph (a)(2)(v) of this section if redundant equipment in the same system was operable and available to perform the required safety function." Although 3 of the 4 CRVS radiation detectors failed, radiation detector 2-RE-26, which is in the same system, was operable and available to perform its required safety function. The failures are not deemed to be a safety system functional failure.

Based on the foregoing, this event is not considered risk significant and did not adversely affect the health and safety of the public.

TEXT

V. Corrective Actions

A. Immediate Corrective Actions

1. Plant technicians verified the absence of a high radiation condition.

2. Plant technicians removed the affected radiation monitors from service.

B. Corrective Actions to Prevent Recurrence

1. The failed radiation detectors were replaced with vendor-verified, defect-free components, 1-RE-25, 1-RE-26, and 2-RE-25.

2. Plant technicians will replace radiation detector 2-RE-26.

3. For future component procurement, a purchasing requirement will be added to ensure that the manufacturer inspect the o-ring sealing components of all replacement detectors to ensure that the component is defect free prior to final assembly. PG&E will formally notify the Vendor of this event and request Vendor to prevent recurrence.

C. Prudent Measure

1. A protective weather coating was applied to the radiation monitors.

VI. Additional Information

A. Failed Components

1-RE-25, Nuclear Measurements Corporation, Model No. GA-2TMO
1-RE-26, Nuclear Measurements Corporation, Model No. GA-2TMO
2-RE-25, Nuclear Measurements Corporation, Model No. GA-2TMO

B. Previous Similar Events

None.

C. Industry Reports

None.