Pacific Gas and Electric Company®

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August 6, 2012

PG&E Letter DCL-12-072

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

10 CFR 50.73

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-2012-003, "Low Temperature Overpressure Protection System Inoperable due to Human Performance Error"

Dear Commissioners and Staff;

Pacific Gas and Electric Company (PG&E) is submitting the enclosed Licensee Event Report in accordance with 10 CFR 50.73(a)(2)(v)(D), for a human performance event that rendered the low temperature overpressure protection (LTOP) system inoperable. On June 7, 2012, at 0129 PDT, PG&E declared both trains of the LTOP system inoperable when the vital 120 VAC Distribution Panel (PY) PY13 was de-energized due to an electrical maintenance technician inadvertently opening the incorrect breaker. Plant staff immediately recognized the error and the technician closed the PY13 supply breaker, thereby re-energizing Panel PY13, returning one train of LTOP to service.

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,

James M. Welsch
Interim Site Vice President

wrl8/50488907
Enclosure
cc: Diablo Distribution
cc/enc: Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Joseph M. Sebrosky, NRR Senior Project Manager
INPO

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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 Section (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 reverse for required number of digits/characters for each block)

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4. TITLE

Low Temperature Overpressure Protection System Inoperable due to Human Performance Error

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
06	07	2012	2012	- 003 -	00	08	06	2012	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

5

10. POWER LEVEL

0

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

☐ 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)
☐ 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)
☐ 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

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Wilbert R. Landreth, Regulatory Services Engineer	(805) 545-6980

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

☐ 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 June 7, 2012, at 0129 PDT, Pacific Gas and Electric Company (PG&E) declared both trains of the Low Temperature Overpressure Protection (LTOP) system inoperable when the vital 120 VAC Panel PY13 was de-energized due to a human performance error. Unit 1 was in Mode 5 and the reactor coolant system (RCS) loops were not filled. Plant technicians were troubleshooting a de-energized vital 120 VAC Panel PY14 that had resulted from the supply breaker inadvertently tripping open. During troubleshooting, a plant technician incorrectly opened the supply breaker to Panel PY13 instead of PY14. With PY14 de-energized, one train of LTOP was inoperable due to loss of signal from RCS Wide Range Pressure Transmitter PT-405A. With PY13 de-energized, the second train of LTOP was rendered inoperable due to loss of signal from RCS Wide Range Pressure Transmitter PT-403A. Plant staff immediately recognized the error and the technician closed the PY13 supply breaker, thereby re-energizing Panel PY13, returning one train of LTOP to service.

On June 7, 2012, at 0856 PDT, PG&E made an 8-hour non-emergency report (Reference NRC Event Notification 48002) under 10 CFR 50.72(b)(3)(v)(D).

As corrective actions, PG&E will conduct human performance skills assessments for Electrical Maintenance (EM) personnel, reinforce human performance expectations with EM supervisors, and revise troubleshooting standards.

NARRATIVE

I. Plant Conditions

At the time of discovery, Unit 1 was in Mode 5 (Cold Shutdown) at 0 percent power with the reactor coolant system (RCS) [AB] loops not filled.

II. Description of Problem

A. Background

The Low Temperature Overpressure Protection (LTOP) system is designed to prevent the reactor [RCT] vessel [VSL] from experiencing brittle fracture due to overpressure transients at low RCS temperatures (e.g., during startup and shutdown). The LTOP system uses two Class 1 Power Operated Relief Valves [PORVs], PCV-455C and PCV-456, that are activated by RCS Wide Range Pressure Transmitters [PT] PT-403A and PT-405A, respectively. Vital 120 VAC Power Distribution Panel PY14 powers PT-405A, and vital 120 VAC Power Distribution Panel PY13 powers PT-403A. Although these two PORVs are required to be operable for LTOP, only one PORV is credited in the LTOP analyses to allow for a single failure.

B. Event Description

On June 6, 2012, at 2111 PDT, the Diablo Canyon Power Plant (DCPP) control room received multiple alarms related to the loss of PY14. The IY14 output breaker [BKR] tripped unexpectedly, de-energizing PY14 and PT-405A, causing the associated alarms. Plant operators declared vital 120 VAC Panel PY14 inoperable.

On June 7, 2012, a plant technician was performing troubleshooting activities associated with the above-mentioned IY14 output breaker trip in accordance with plant procedures. The plant technician placed a correct component verification (CCV) label on the upper section of IY14 and began troubleshooting. The troubleshooting plan directed the opening and closing of the output breaker on IY14 five times. The technician removed all loads from PY14 and verified that IY14 and PY14 had no fuse [FU] or equipment problems. The troubleshooting team reconvened and determined maintenance should perform testing on the circuit to verify cable integrity before returning IY14 to service. This step required opening the output breaker on IY14. The IY14 output breaker manipulations were coordinated between the technician performing the work in the field and control room using the plant telephone system. During the phone call to the control room, the three other individuals moved from IY14 to IY13 to give the technician more room to perform his task. After the phone call, the technician went to the panel where the individuals were located and opened the output breaker on Inverter IY13 instead of IY14. This condition resulted in loss of AC power to Safety-Related Distribution Panel PY13 and resultant Solid-State Protection System Train B error alarm.

On June 7, 2012, at 0129 PDT, DCPP operators declared both trains of the LTOP system inoperable when the vital 120 VAC Panel PY13 was de-energized due to the plant technician's inadvertent opening of the IY13 output breaker during the PY14 troubleshooting activities. With PY13 momentarily de-energized, the second train of LTOP was rendered inoperable due to loss of signal from PT-403A placing the plant in Technical Specification (TS) Condition 3.4.12.G with "two required RCS Class 1 PORVs inoperable in Mode 5 or 6, with the vessel head closure bolts not fully de-tensioned." The technician immediately closed the PY13 supply breaker after recognizing his error, thereby re-energizing panel PY13 less than 5 seconds after de-energizing it. Operations completed the necessary paper

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closure and returned one train of LTOP back to operable within nine minutes. This condition resulted in a Safety System Functional Failure for Unit 1 LTOP.

On June 7, 2012, at 0856 PDT, PG&E made an 8-hour non-emergency report of the event (Reference NRC Event Notification 48002) under 10 CFR 50.72(b)(3)(v)(D).

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

None.

D. Other Systems or Secondary Functions Affected

The control room ventilation system (CRVS) and the fuel handling building [BLDG] ventilation system (FHBVS) realigned to their safeguards alignments, as expected, due to the de-energization of associated radiation monitors [MON] (RM) RM-26 and RM-59.

E. Method of Discovery

The control room received multiple alarms related to the loss of PY13.

F. Operator Actions

Operators declared both trains of the LTOP system inoperable when the technician inadvertently de-energized vital 120 VAC panel PY13. Plant staff immediately recognized the error and the technician closed the PY13 supply breaker, thereby re-energizing Panel PY13, restoring the functionality of one train of LTOP.

G. Safety System Responses

The CRVS swapped to its safeguards alignment after RM-26 alarmed due to loss of PY13. The FHBVS swapped to its safeguards alignment after RM-59 lost power due to loss of PY13. Both the CRVS and FHBVS responded appropriately. DCPP operators reset the associated RM after verifying that it responded solely because power to PY13 was lost.

III. Cause of the problem

A. Apparent Cause

Electrical Maintenance (EM) supervisors have not consistently reinforced self-checking standards.

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B. Contributing Cause

(1) EM allowed use of a troubleshooting plan which did not meet work instruction quality standards as described in DCPP Procedure, AD7.DC8, "Work Planning," in that specific component identifiers and sign-offs for each step were not provided.

(2) EM allowed use of a troubleshooting plan without establishing robust barriers on adjacent equipment to prevent mis-operation.

IV. Assessment of Safety Consequences

The potential for over pressurizing the reactor vessel is greatest when the RCS is water solid. During this event, the RCS loops were not filled and the RCS was thus not water solid. During Mode 5 (Cold Shutdown with all reactor vessel head closure bolts fully tensioned), TS Limiting Condition for Operation 3.4.12, "Low Temperature Overpressure Protection System," provides RCS overpressure protection by limiting coolant input capability to the RCS and having adequate pressure relief capacity. The LCO specifies that no safety injection pumps, and only one centrifugal charging pump, are capable of injecting into the RCS, and all of the accumulator discharge isolation valves are deactivated in the closed position. Considering the plant conditions at the time of this occurrence, it is not credible that enough mass or heat energy could be injected into the RCS to cause a low temperature overpressure event while the LTOP system was incapable of actuating for less than 5 seconds.

V. Corrective Actions

DCPP performed an Apparent Cause Evaluation of this occurrence and developed the corrective actions described below.

A. Corrective Actions

(1) Perform a "Skills Assessment" for EM personnel to ensure human performance verification standards and the use of robust barriers are clearly understood and can be successfully demonstrated. A remediation plan will be developed for those workers that cannot demonstrate the knowledge and proficiency of the standard.

(2) Counsel EM supervisors on expectations for reinforcement of self checking, correct component verification (CCV), and the use of robust barriers and establish supervisor commitment and accountability.

(3) Revise DCPP Procedure MA1.DC10, "Troubleshooting," Revision 12, to provide direction that troubleshooting plans will comply with station work instruction and documentation quality standards as described in DCPP Procedure AD7.DC8, "Work Planning," and to specify the use of robust barriers.

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VI. Additional Information

A. Failed Components

None.

B. Previous Similar Events

On February 28, 2008, maintenance workers began work on Unit 2 Main Steam (MS) Lead Check Valve MS-2-2066 in error. Workers were assigned to perform a check valve inspection on Valve MS-2-1068. As workers completed work on MS-2-42, the workers were then ready to work on Valve 2-MS-1068, which was said to be adjacent to MS-2-42. There were two valves in the area, MS-2-1068, and MS-2-2066, both with insulation removed. All the valves in the area no longer have any operator valve identification (OVID) tags. The workers assumed which valve to work on by deducing that the removed insulation and staged rigging over Valve MS-2-2066 identified the correct valve. Subsequently, the workers began disassembling the wrong valve. On February 29, 2008, a worker obtained the OVID drawings, and identified that the valve in progress was MS-2-2066, not MS-2-1068. The worker immediately notified the supervisor.

On May 16, 2011, as part of the 230kV Startup System Reliability Upgrade Project, PG&E was making a physical modification to the 12kV startup relay board panel (RU). During cutting of the RU with a reciprocating saw, the 230kV Line Differential Relay 287 actuated and sent a trip signal to the Unit 1 Startup Transformer 11 output breaker to the Unit 1 Startup bus and to the Unit 2 startup Transformer 21 output breaker (cleared at the time) to the Unit 2 startup bus.

On May 27, 2011, while performing function testing of Unit 2 Relay 87UT21, technicians inadvertently began testing on Unit 1 Relay 51/87 UT11, initiating a trip signal for the Unit 1 Startup Transformer 11 hi-side circuit interrupter and output supply breaker to the Unit 1 startup bus.