



**Pacific Gas and
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May 25, 2011

PG&E Letter DCL-11-063

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

10 CFR 50.73

Docket No. 50-323, OL-DPR-82
Diablo Canyon Unit 2
Licensee Event Report 2-2011-001-00: Unit 2 Reactor Trip From Loss of Main
Feedwater Pump 2-1

Dear Commissioners and Staff:

In accordance with 10 CFR 50.73(a)(2)(iv)(A), Pacific Gas and Electric Company is submitting the enclosed licensee event report regarding the Diablo Canyon Power Plant Unit 2 reactor trip from the loss of main feedwater pump 2-1.

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

swh2/50384994

Enclosure

cc/enc: Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC Senior Resident Inspector
Alan B. Wang, NRR Project Manager
James T. Polickoski, NRC Licensing Project Manager
INPO
Diablo Distribution

JE22
NRH

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

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.

1. FACILITY NAME

Diablo Canyon Power Plant

2. DOCKET NUMBER

05000 323

3. PAGE

1 OF 4

4. TITLE

Unit 2 Reactor Trip From Loss of Main Feedwater Pump 2-1

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	26	2011	2011	- 1 -	0	05	25	2011	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

98

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

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below
or in NRC Form 366A |

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Thomas R. Baldwin, Manager, Regulatory Services

TELEPHONE NUMBER (Include Area Code)

(805) 545-4720

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	SL	RV	L265	N	B	SJ	CON		N

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 March 26, 2011 at 1449 PDT operators at Diablo Canyon Power Plant (DCPP) Unit 2 manually initiated a reactor trip in response to loss of main feedwater pump 2-1. The main feedwater pump 2-1 tripped after non-radioactive water sprayed on its control console. The water spray was caused by leakage from the flange of the relief valve on the feedwater heater 2-1A condenser dump valve line. All rods fully inserted on the reactor trip. The reactor was cooled by the auxiliary feedwater system with the condenser in service. All systems performed as designed with no unexpected pressure or level transients. Automatic main feedwater isolation, auxiliary feedwater actuation, and steam generator blowdown isolation occurred as expected.

ENS notification 46701 provided the 4-hour non-emergency event report for the manual reactor trip of DCPP Unit 2 in accordance with 10 CFR 50.72(b)(2)(iv)(B), RPS Actuation (scram). Additionally, this notification provided the 8-hour non-emergency event report of the automatic actuation of the auxiliary feedwater system as a result of the reactor trip in accordance with 10 CFR 50.72(b)(3)(iv)(A), Specified System Actuation.

The cause of the event was determined to be a failed gasket for the relief valve due to bolt torquing practices. Corrective actions include revising DCPP's bolt torquing procedure to provide bolt torquing specifications for bolted connections.

**LICENSEE EVENT REPORT (LER) U.S. NUCLEAR REGULATORY COMMISSION
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NARRATIVE

I. Plant Conditions

At the time of the event, Diablo Canyon Power Plant (DCPP) Unit 2 was in Mode 1 (Power Operation) at 98 percent reactor power with normal operating reactor coolant temperature and pressure.

II. Description of Problem

A. Background

During the month of March 2011, plant operators identified that a relief valve, XS-2-RV-95, on a feedwater heater [SJ] had developed a leak and would require monitoring and repair. The relief valve leak worsened and began spraying hot feedwater on plant components in the general area of the relief valve.

B. Event Description

On March 23, 2011, the Unit 2 Turbine Watch identified a developing steam leak on XS-2-RV-95.

On March 26, 2011 at 0930, a plant operator identified that the leak on XS-2-RV-95 had increased, prompting a decision to isolate the associated feedwater heater 2-1A. During the initial attempt to isolate XS-2-RV-95, the leak increased significantly and wetted the adjacent Main Feedwater (MFW) Pump 2-1 control panel, causing several MFW Pump 2-1 alarms. The MFW Pump 2-1 control panels were covered and plant operators subsequently reduced the magnitude of the leak by isolating feedwater heater 2-1A.

On March 26, 2011 at 14:49, plant operators manually tripped Unit 2 reactor from 98% power following an automatic trip of MFW Pump 2-1.

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

None

D. Other Systems or Secondary Functions Effected

None

E. Method of Discovery

A plant operator observed leakage from relief valve XS-2-RV-95 during normal rounds. They also observed that the leakage was spraying the MFW Pump 2-1 and wetting the associated control panel.

F. Operator Actions

Plant operators initiated a manual reactor trip in accordance with Abnormal Operating Procedure OP AP-15, "Loss of Feedwater Flow," following the automatic trip of MFW Pump 2-1.

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G. Safety System Responses

An automatic actuation of the auxiliary feedwater system, steam generator blowdown isolation, and main feedwater isolation occurred during the plant shutdown. These actuations were expected and all components functioned as designed.

III. Cause of the Problem

A. Immediate Cause

The local MFW Pump 2-1 electronic components were subjected to hot feedwater spray from a leaking relief valve. As a result, when MFW Pump 2-1 was subjected to the hot feedwater spray from the XS-2-RV-95 failed inlet flange gasket, a grounded circuit for low-low lube oil reservoir level [SJ] caused the MFW Pump 2-1 automatic trip.

B. Root Cause

The preliminary root cause identified that Maintenance Procedure MP M-54.1, "Bolt Fabrication and Tensioning," allowed the fasteners for bolted connections using sheet type gasket material to be tensioned to "snug tight" versus providing specific bolt torque requirements. As a result, flange gasket preload has not been consistently applied when sheet type gasket material is used. The failed gasket for the relief valve was installed using this maintenance procedure.

IV. Assessment of Safety Consequences

The DCPP Unit 2 shutdown was normal and as expected following the automatic feedwater pump trip and subsequent manual reactor trip. The Solid State Protection System functioned as designed upon receipt of the manual reactor trip signal. The reactor trip breakers opened and all control rods and shutdown rods inserted as designed. The automatic auxiliary feedwater system actuation was expected with all system components functioning as designed. This Condition I event was within the bounds of the Updated Final Safety Analysis Report and the post trip transient response was as expected. As such, this event is not considered risk significant and it did not adversely affect the health and safety of the public.

V. Corrective Actions

A. Immediate Corrective Actions

Plant operators initiated a manual reactor trip in accordance with OP AP-15 following the automatic trip of MFW pump 2-1.

B. Corrective Actions to Prevent Recurrence (CAPR)

Using the change management process, Maintenance Procedure MP M-54.1, "Bolt Fabrication and Tensioning," was revised to specify torque requirements for tensioning fasteners that are greater than one half inch on bolted connections, regardless of classification and use, with the exception of soft gasket material (e.g. rubber, Teflon, and Neoprene).

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VI. Additional Information

A. Failed Components

XS-2-RV-95 inlet gasket

B. Previous Similar Events

The XS-2-RV-95 inlet gasket had previously failed during a plant shutdown for refueling on October 26, 2004. This previous gasket failure did not produce a MFW pump trip or unit shutdown.

C. Industry Reports

INPO Operating Experience Report OE 33263, Main Feedwater Pump Amphenol Connection Water Intrusion Results in Manual Plant Trip (DCPP2).