Pacific Gas and Electric Company®

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PG&E Letter DCL-06-015

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

Docket No. 50-323, OL-DPR-82
Diablo Canyon Unit 2
Licensee Event Report 2-2005-001-01
Technical Specification 3.4.10 Not Met During Pressurizer Safety Valve Surveillance Testing Due to Random Lift Spread

Dear Commissioners and Staff:

In accordance with 10 CFR 50.73(a)(2)(i)(B), Pacific Gas and Electric Company is submitting the enclosed revision to a licensee event report regarding the pressurizer code safety valves being outside the Technical Specification 3.4.10, "Pressurizer Safety Valves," set pressure due to random lift spread. This revision includes additional actions identified to control random lift spread and reduce out of tolerance reporting.

This event was not considered risk significant and did not adversely affect the health and safety of the public.

Sincerely,

David H. Oatley

ddm/2246/A0637670
Enclosure
cc/enc: Bruce S. Mallett, NRC Region IV
Terry W. Jackson, NRC Senior Resident
Alan B. Wang, NRC Project Manager
INPO
cc: Diablo Distribution

IE22

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

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 2	05000323	1 OF 5

4. TITLE

TS 3.4.10 Not Met During Pressurizer Safety Valve Surveillance Testing Due to Random Lift Spread

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 1	05000275
01	27	2005	2005	- 001 -	01	01	31	2006	FACILITY NAME	DOCKET NUMBER 05000

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)
Lawrence M. Parker – Senior Regulatory Services Engineer	(805) 545- 3386

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
X	AB	RV	C710	Yes					

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 January 27, 2005, during scheduled testing in accordance with Surveillance Test Procedure M-77, "Safety and Relief Valve Testing," Pacific Gas and Electric Company (PG&E) identified two of three pressurizer safety valves (PSVs) outside the Technical Specification (TS) 3.4.10, "Pressurizer Safety Valves, ... lift setting of ≥2460 and ≤2510 psig." The as-found lifts were 4.4 and 3.6 percent low, and within analyzed safety limits; thus, this condition did not adversely affect the health and safety of the public.

The PSVs were disassembled, inspected, and reset within the TS 3.4.10 lift setting requirements. PG&E believes the cause of the PSVs being outside the TS allowance is random lift spread.

PSV lift setting repeatability has been recognized as an industry-wide problem. PG&E has participated in extensive investigative test programs, both jointly with the nuclear steam supply system vendor, Westinghouse Owners Group, and independently. The results of the industry investigations are documented in WCAP-12910, "Pressurizer Safety Valve Set Pressure." PG&E has reanalyzed PSV capability, revised TS 3.4.10 bases, and enhanced the PSV testing procedures consistent with the revised analysis criteria.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Diablo Canyon Unit 2	0 5 0 0 0 3 2 3	2005	- 0 0 1 -	0 1	2 OF 5

TEXT

I. Plant Conditions

Unit 2 has operated in various plant modes with the described condition.

II. Description of Problem

A. Background

Technical Specification (TS) 3.4.10, "Pressurizer Safety Valves" (PSVs), requires that three PSVs [AB][RV] shall be operable with a lift setting greater than or equal to 2460 psig and less than or equal to 2510 psig corresponding to ambient conditions of the valve at nominal operating temperature and pressure. This upper and lower pressure limit is based on a nominal pressure of 2485 psig, with an upper and lower tolerance limit of plus or minus one percent. TS 3.4.10 and associated bases did not discuss the as-found testing analysis limits for the PSVs.

Surveillance Test Procedure (STP) M-77, "Safety and Relief Valve Testing," verifies the PSV's lift setting in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI. The initial (as-found) lift setting is evaluated for TS compliance. STP M-77 requires that the valves lift within the required tolerance in order to declare them operable.

STP M-77 test methodology obtains the as-found lift setting by placing the PSVs in an environmentally controlled enclosure and heating the ambient air to the temperature conditions typical at Diablo Canyon Power Plant (DCPP). The loop seal is also heated to simulate the piping temperature conditions at DCPP. Testing is accomplished by the addition of steam at a defined ramp rate. Steam is added until physical evidence of stem movement is visible on the remote data acquisition display screen. The data is then reviewed to ascertain first discernible stem movement and the pressure at which it took place.

B. Event Description

Following the Unit 1 eleventh refueling outage in May 2002, the subject PSVs lift settings were verified to be within the range required by TS 3.4.10. The PSVs were then returned to warehouse stock. During the Unit 2 eleventh refueling outage in February 2003, these three PSVs were placed in service in Unit 2 without any additional adjustment of the lift settings. The valves were replaced during the Unit 2 twelfth refueling outage in November 2004 and tested offsite in January 2005.

TEXT

On January 27, 2005, during scheduled offsite testing in accordance with STP M-77, "Safety and Relief Valve Testing," Pacific Gas and Electric Company (PG&E) identified two of three PSVs outside the TS 3.4.10, "Pressurizer Safety Valves, ... lift setting of ≥2460 and ≤2510 psig." The initial lift settings were 4.4 and 3.6 percent low. The second valve lifts of these same two PSVs were found to be 3.1 percent low and 0.3 percent low, respectively.

PSV lift setting repeatability has been recognized as an industry-wide problem. PG&E has participated in extensive investigative test programs, both jointly with the nuclear steam supply system vendor, Westinghouse Owners Group, and independently. The results of the industry investigations are documented in WCAP-12910, "Pressurizer Safety Valve Set Pressure."

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

None.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

This condition was identified during routine scheduled testing of the three PSVs performed in accordance with STP M-77 at the offsite testing facility.

F. Operator Actions

None.

G. Safety System Responses

None.

III. Cause of the Problem

A. Immediate Cause

Two of three PSVs did not lift within the TS 3.4.10 lift setting tolerance.

B. Root Cause

The cause of the as-found lift setting has been determined to be random lift spread.

C. Contributory Cause

None.

IV. Assessment of Safety Consequences

The limiting event for evaluating the lift setting is the loss of load analysis that requires the maximum reactor coolant system (RCS) pressure of 2750 psia not be exceeded. The RETRAN computer model was run to determine if, with the as-found PSV lift setpoint, the RCS pressure would exceed 110 percent of ASME design acceptance criteria, or 2750 psia. The analysis confirmed that the as-found set points would have maintained adequate RCS pressure relief capacity, such that the plant remained bounded by the limiting loss of load analysis provided in Final Safety Analysis Report Update, Section 15.2.7, "Loss of External Electrical Load and/or Turbine Trip." Also, the as-found lift setting was reviewed for potential interaction with the pressurizer power-operated relief valves and the potential for inadvertent low pressure lifting, and were found acceptable.

Therefore, this event was of very low risk significance, was not a Safety System Functional Failure, and did not adversely affect the health and safety of the public.

V. Corrective Actions

A. Immediate Actions

The valves were disassembled, inspected, reset within tolerance, and returned to warehouse stock. No degraded PSV condition was identified.

B. Corrective Actions

1. PG&E has revised the loss-of-load analysis to determine the upper and lower as-found allowable PSV lift setting. This reanalysis formed the technical basis for a change in the acceptance criteria utilized for the evaluation of the as-found lift setting of the PSVs.

2. PG&E has updated the TS 3.4.10 bases to reflect the above reanalysis conditions and establish the as-found surveillance test criteria.
3. PG&E has revised STP M-77 to reflect the applicable testing conditions and as-found lift setting criteria in the revised TS 3.4.10 bases.

VI. Additional Information

A. Failed Components

None.

B. Previous Similar Events

Licensee Event Report (LER) 1-94-009, Revision 2, submitted in PG&E Letter DCL-95-248, dated November 7, 1995, regarding PSVs found outside TS limits during the Unit 1 sixth refueling outage. The root cause of this event was determined to be random lift-setting spread. No corrective action to prevent recurrence was required because this inherent characteristic of the valve was within the analysis basis of DCPP.

LER 1-95-016, Revision 2, submitted in PG&E Letter DCL-98-077, dated May 28, 1998, regarding PSVs found outside TS limits during the Unit 1 seventh refueling outage. The root cause of this event was determined to be random lift setting spread. No corrective action to prevent recurrence was required because this inherent characteristic of the valve was within the analysis basis of DCPP.

LER 2-2001-004, submitted in PG&E Letter DCL-01-090, dated August 27, 2001, regarding one PSV found 3.4 percent low and one PSV found 2.8 percent high during offsite testing. The root cause of this event was determined to be random lift-setting spread. No corrective action to prevent recurrence was required because this inherent characteristic of the valve was within the analysis basis of DCPP.
LER 1-2002-005-00, submitted in PG&E Letter DCL-02-091, dated August 9, 2002, regarding one PSV found 1.9 percent low and one PSV found 2.6 percent high during offsite testing. The root cause of this event was determined to be random lift-setting spread. No corrective action to prevent recurrence was required because this inherent characteristic of the valve was within the analysis basis of DCPP.