Pacific Gas and Electric Company

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August 27, 2001

PG&E Letter DCL-01-090

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 2-2001-004-00
Technical Specification 3.4.10 Not Met During Pressurizer Safety Valve Surveillance Testing Due to Random Lift Setting Spread

Dear Commissioners and Staff:

PG&E is submitting the enclosed licensee event report regarding the pressurizer code safety valves being outside Technical Specification 3.4.10 tolerance due to random lift setting spread.

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

Sincerely,

David H. Oatley

cc: Ellis W. Merschoff
David L. Proulx
Girija S. Shukla
Diablo Distribution
INPO

Enclosure

DDM/2246/A0536471E03

IE22

LICENSEE EVENT REPORT (LER)

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TITLE (4)

Technical Specification 3.4.10 Not Met During Pressurizer Safety Valve Surveillance Testing Due to Random Lift Setting Spread

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	26	2001	2001	- 0 0 4 -	0 0	08	27	2001		

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (11)
1	X 10 CFR 50.73(a)(2)(i)(B)
POWER LEVEL (10)	OTHER
1 0 0	(SPECIFY IN ABSTRACT BELOW AND IN TEXT, NRC FORM 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER AREA CODE	
Roger Russell - Senior Regulatory Services Engineer	805	545-4327

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	A B	R V	C 7 1 0	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MON	DAY	YR
[ ] YES (If yes, complete EXPECTED SUBMISSION DATE)	[X] NO				

ABSTRACT (Limit to 1400 spaces. i.e., approximately 15 single-spaced typewritten lines.) (16)

On June 26, 2001, during a routine scheduled performance of Surveillance Test Procedure M-77, "Safety and Relief Valve Testing," PG&E identified the second of three pressurizer safety valves (PSVs) outside the Technical Specification (TS) 3.4.10, “Pressurizer Safety Valves,” tolerance lift setting of greater than 2460 psig and less than 2510 psig.

The PSVs were disassembled, inspected, and reset within TS lift setting at the offsite test facility.

PG&E believes the cause of the PSV lift setting being outside the TS allowance is random lift setting 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, Westinghouse Owners Group, and independently. The results of the industry investigations are documented in WCAP-12910, “Pressurizer Safety Valve Set Pressure.” PG&E has enhanced the PSV maintenance activities and testing procedures resulting in improved performance. No further corrective actions are required.

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,” requires that three pressurizer safety valves (PSVs) shall be operable with a lift setting of greater than 2460 psig and less than 2510 psig corresponding to ambient conditions of the valve at nominal operating temperature and pressure.

Surveillance Test Procedure (STP) M-77, "Safety and Relief Valve Testing," verifies the PSVs lift setting in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI. The initial 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

During the Unit 2 ninth refueling outage in 1999, all three PSVs were placed in service and declared operable without any additional adjustment of the lift settings until the PSVs were checked following removal in May 2001.

On June 26, 2001, two of the three Unit 2 PSVs were identified with lift setting outside TS 3.4.10 requirements. One PSV was found with a lift setting less than 2460 psig and one PSV was found with a lift setting of greater than 2510 psig. The valves were found to lift 3.4 percent low and 2.8 percent high, respectively during offsite testing.

TEXT

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, Components, or Systems that Contributed to the Event

None.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

This condition was discovered by PG&E while performing a routine scheduled surveillance test in accordance with STP M-77.

F. Operator Actions

None.

G. Safety System Responses

None.

III. <u>Cause of the Problem</u>

A. Immediate Cause

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

B. Root Cause

The cause of the lift setting change has been determined to be the random lift setting spread.

C. Contributory Cause

None.

TEXT

IV. Analysis of the Event

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 code model was run to determine if RCS pressure would exceed 110 percent of ASME design or 2750 psia. The RETRAN computer code model for DCPP was used to determine the potential effect on peak pressure due to the high PSV lift setting. The following cases were evaluated and found to fully bound the range of as-found PSV lift settings for the past operation of Unit 2 Cycle 10. For simplicity the three PSVs are labeled 1, 2, and 3 in the RETRAN model. All pressure values are in psia.

CASE	PSV1	PSV2	PSV3	Peak RCS Pressure
1	2453	2525	2580	2702 psia
2	2500	2500	2580	2714 psia
3	2500	2525	2580	2730 psia
4	2525	2525	2580	2748 psia

Assuming the most conservative Case 4, with both of the other PSVs at their maximum 1 percent drift combined with the high lift of 2580 psia, the analysis would not have resulted in exceeding the 2750 psia limit. In actuality, one PSV had drifted low sometime during the cycle such that one of the less limiting cases is more representative of the peak pressure results for a loss of load event. All of these cases are conservative. There is no analytical credit taken for the redundant pressurizer spray valves or the three power operated relief valves' actuation. The analysis also assumes 102 percent reactor power, a maximum RCS average temperature of 587.5 degrees Fahrenheit, and a maximum beginning of life moderator temperature coefficient and Doppler feedback coefficients.

The conservatism of these RETRAN results provide more than reasonable engineering assurance that the drift in PSV lift settings would not have resulted in a challenge to the PSV operability with respect to RCS over pressure protection.

Therefore, the event:

- Is of very low risk significance;
- did not adversely affect the health and safety of the public; and
- was not a Safety System Functional Failure.

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TEXT

V. Corrective Actions

A. Immediate Corrective Actions

The valves were disassembled, inspected, reset within tolerance, and returned to warehouse stock.

B. Corrective Actions to Prevent Recurrence

No corrective action to prevent recurrence was required because this inherent characteristic of the valve is within the analysis basis of DCPP.

VI. Additional Information

A. Failed Components

None.

B. Previous Similar Events

Voluntary LER 1-88-018, submitted in PG&E Letter DCL-89-172, dated June 27, 1989, regarding PSVs found outside TS limits during refueling outages. No root cause or corrective actions could be established for the generic industry problem of lift setting drift of the PSVs. Therefore, the corrective actions taken for LER 1-88-018 did not prevent this event.

LER 1-94-009, 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. However, a prudent action to replace the PSV upper spring washer was recommended. The implementation of this prudent action has been deferred until NRC concerns regarding valve performance can be acceptably resolved.

LER 1-95-016, 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. However, a prudent action to replace the PSV upper spring washer was recommended. The implementation of this

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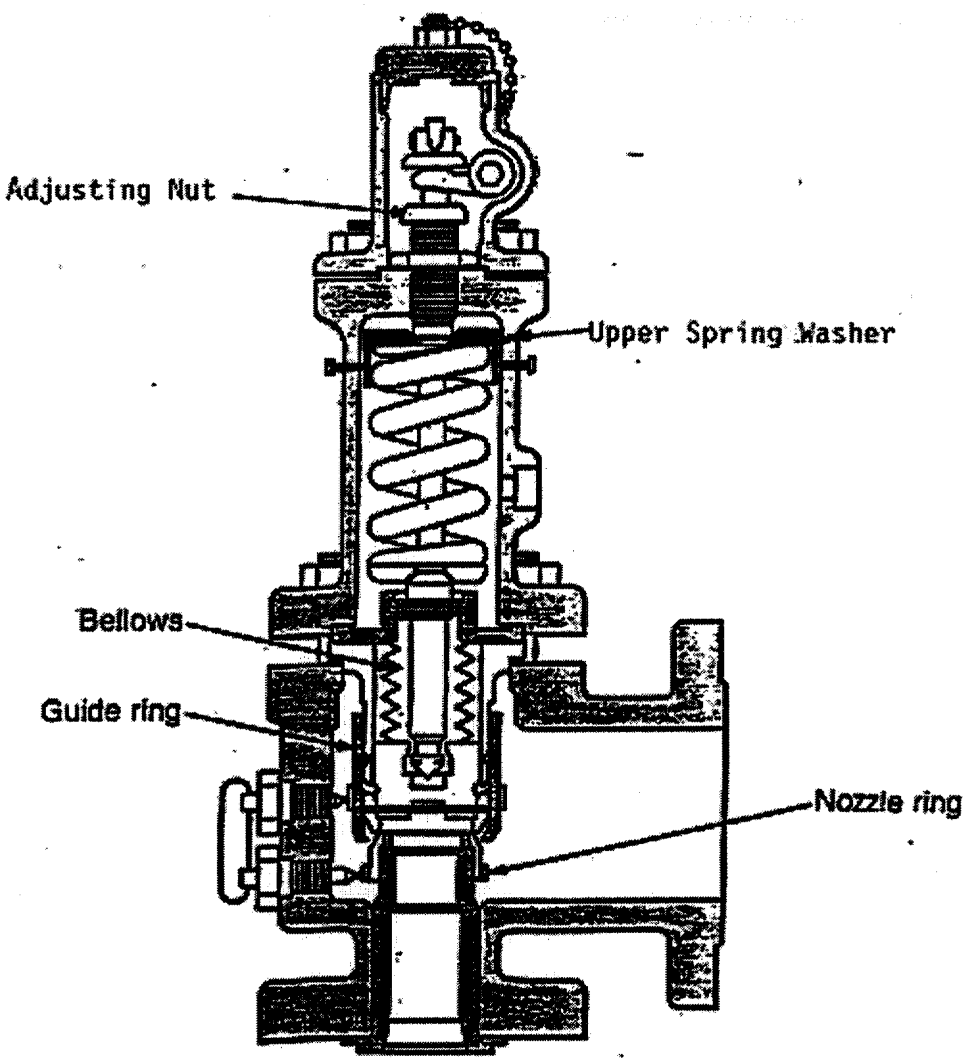
Diablo Canyon Unit 2	0	5	0	0	0	3	2	3	2001	-	0	0	4	-	0	0		6	OF	6

TEXT

prudent action has been deferred until NRC concerns regarding valve performance can be acceptably resolved.



Typical PSV Cross Section