

PRIORITY 1

(ACCELERATED RIDS PROCESSING)

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ACCESSION NBR: 9511200165 DOC. DATE: 95/10/30 NOTARIZED: NO DOCKET # 05000275
 FACIL: 50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga
 AUTH. NAME AUTHOR AFFILIATION
 BEHNKE, D. Pacific Gas & Electric Co.
 RUEGER, G.M. Pacific Gas & Electric Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-009-02: on 940928, TS 3.4.2.1 & 3.4.2.2 were not met during pressurizer code safety valve surveillance testing due to random setpoint spread. Reset Unit 1 PSVs to required tolerance using STP-M-77.W/951107 ltr.

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ADD



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Gregory M. Rueger
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General Manager
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November 7, 1995

PG&E Letter DCL-95-248

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-94-009-02
Technical Specification 3.4.2.1 and 3.4.2.2 Not Met During Pressurizer Safety
Valve Surveillance Testing Due to Random Setpoint Spread

Gentlemen:

PG&E is submitting the enclosed revision to Licensee Event Report 1-94-009 regarding Technical Specifications 3.4.2.1 and 3.4.2.2 not being met during pressurizer code safety valve surveillance testing due to random setpoint spread. This revision is being submitted to revise the previous corrective action.

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

Sincerely,



Gregory M. Rueger

cc: Steven D. Bloom
L. J. Callan
Kenneth E. Perkins
John J. Russell
Michael D. Tschiltz
Diablo Distribution
INPO

Enclosure

DC1-89-TN-N099

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PDR ADOCK 05000275
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LICENSEE EVENT REPORT (LER)

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TITLE (4) **Technical Specification 3.4.2.1 And 3.4.2.2 Not Met During Pressurizer Code Safety Valve Surveillance Testing Due to Random Setpoint Spread**

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MON	DAY	YR	YR	SEQUENTIAL NUMBER		REVISION NUMBER	MON	DAY	YR	FACILITY NAMES	
03	28	94	94	- 0 0 9	- 0 2		10	30	95		
										DOCKET NUMBER (S) 0 5 0 0 0	

OPERATING MODE (9) **6** THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (11)

POWER LEVEL (10) 0 0 0	<input checked="" type="checkbox"/> 10 CFR <u>50.73(a)(2)(i)(B)</u> <input type="checkbox"/> OTHER - _____ (Specify in Abstract below and in text, NRC Form 366A)
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LICENSEE CONTACT FOR THIS LER (12)

Don Behnke, Senior Regulatory Services Engineer	TELEPHONE NUMBER AREA CODE 805 NUMBER 545-2629
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	A B	R V	C 7 1 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO			

ABSTRACT (16)

On March 28, 1994, with Unit 1 in Mode 6 (Refueling), Technical Specifications (TS) 3.4.2.1 and 3.4.2.2 were not met when three Unit 1 pressurizer code safety valve (PSV) setpoints were found outside 2485 psig, plus or minus 1 percent during testing conducted at the Westinghouse Service Center (WSC) test facility in Beaumont, California.

The Unit 1 PSVs were reset at the WSC test facility to the required tolerance using Surveillance Test Procedure M-77, "Safety and Relief Valve Testing."

The root cause of the PSV setpoints being outside the TS tolerance is random setpoint spread.

PG&E has participated in industry and independent PSV setpoint investigations. These investigations confirm the adequacy of the present test methodology and that adequate margin exists to accommodate the identified random setpoint spread characteristics of the valves. PG&E is investigating a design change to the PSV upper spring washer that has preliminarily been shown to reduce the magnitude of the random setpoint spread by approximately 50 percent. PG&E will not implement this design change until an acceptable testing method and facility can be found.



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TEXT (17)

I. Plant Conditions

Unit 1 was in Mode 6 (Refueling).

II. Description of Problem

A. Summary:

On March 28, 1994, with Unit 1 in Mode 6 during the Unit 1 sixth refueling outage (1R6), Technical Specification (TS) 3.4.2.1. and 3.4.2.2 were not met for three Unit 1 pressurizer code safety valves (PSV)(AB)(RV) found outside the 2485 psig, plus or minus 1 percent tolerance during testing conducted at the Westinghouse Service Center (WSC) test facility.

The Unit 1 PSVs were reset at the WSC test facility to the required tolerance.

B. Background:

TS 3.4.2.1 and 3.4.2.2 require that all PSVs shall be operable with a lift setting of 2485 psig, plus or minus 1 percent with the lift setting pressure corresponding to ambient conditions of the valve at nominal operating temperature and pressure.

Surveillance Test Procedure (STP) M-77, "Safety and Relief Valve Testing," requires that the PSVs be verified for lift setting by testing a determined group in order to meet the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, with Addenda through Summer of 1978. STP M-77 requires that the valves lift twice consecutively without adjustment within the required tolerance in order to declare them operable.

The WSC test methodology for obtaining the as-found lift settings consists of placing the PSV in an environmentally controlled room 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 are then reviewed to ascertain "first discernible stem movement" and the pressure at which it took place.

C. Event Description:

During the Unit 1 fifth refueling outage (1R5) in 1992, all three PSVs were tested at the WSC. The valves were then fully disassembled, refurbished, retested, returned to the plant, installed, and declared operable without any additional adjustment of the setpoints until the safeties were checked at WSC on March 28, 1994.



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TEXT (17)

On March 28, 1994, with Unit 1 in Mode 6, TS 3.4.2.1 and 3.4.2.2 were not met when the setpoints for three Unit 1 PSVs were determined to be outside the 2485 psig plus or minus 1 percent tolerance during testing conducted at the WSC test facility. One valve was tested high at +2.70 percent and two valves were tested low at -1.81 and -2.70 percent.

Subsequently, PG&E completed its pressurizer safety valve test program. A summary of the program results are as follows: The program consisted of participation in the Westinghouse Owners Group (WOG) testing and additional independent valve testing to help determine the root cause of the measured setpoint drift. The most significant contributor identified was the inherent repeatability of the valve setpoint between successive tests under controlled conditions or random setpoint spread.

The large deviations in set pressure are a result of the interaction of the spring, the upper spring washer, and the nose of the adjusting bolt (see sketch, page 6) as they pivot. In a standard valve, the lower spring washer pivots around its seating surface on the lower spindle boss. The upper washer pivots in a similar manner, but it is seated against the rounded nose of the adjusting bolt. As the spring compresses, the forces compressing the spring are not evenly distributed on the washers. This is due to the machining of the spring coils at both ends of the spring to make them flat. This results in the first coil on either end being tapered. As the spring compresses, the forces are distributed around the washer in relation to the thickness of the coil. Consequently, more of the load is transferred to the thicker section of the spring resulting in the spring forces being biased and minute buckling of the spring. In addition, the rounded seating surfaces on both ends allows the spring to assume various shapes as it actuates.

A prototype valve with a modified upper spring washer was developed and tested in order to reduce the minute buckling and pivoting that takes place in the standard valve arrangement. The valve with the modified washer was comparison tested to the standard Crosby valve. Testing was performed under identical environmental conditions for both valves. No adjustments were made to either valve type throughout the tests. The standard Crosby valve demonstrated a standard deviation (67 percent) of 22.5 psi. The magnitude of this value is nearly equal to the TS tolerance of 24.8 psi. The prototype Crosby valve demonstrated a standard deviation (67 percent) of 11.4 psi.

On September 7, 1995, PG&E received a request for additional information regarding an NRC concern for certification testing in accordance with the requirements of NUREG 0730, Item II.D.1. Based upon discussions with the NRC staff, additional assurance that the PSV's performance is not altered by the design change is recommended. Due to the unavailability of a domestic facility with the capability to perform the recommended valve testing, PG&E has deferred installing PSVs with the modified design.

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



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TEXT (17)

None.

E. Dates and Approximate Times for Major Occurrences:

March 28, 1994: Event/discovery date. Three PSVs were determined to be outside the required TS 3.4.2.1. and 3.4.2.2 tolerance.

F. Other Systems or Secondary Functions Affected:

None.

G. Method of Discovery:

This event was discovered during the routine scheduled testing of the Unit 1 PSVs conducted offsite at the WSC.

H. Operator Actions:

None.

I. Safety System Responses:

None.

III. Cause of the Problem

A. Immediate Cause:

The PSVs did not lift within their TS tolerance band of plus or minus 1 percent.

B. Root Cause

The cause of the setpoint change was determined to be the random setpoint spread.

C. Contributing Cause

A contributing cause of the measured random setpoint spread is the set pressure deviation characteristic of the valve. PG&E has found that a more rigidly restrained upper spring washer can reduce the setpoint deviation during controlled testing.

IV. Analysis of the Event

The most limiting transient that results in the actuation of the PSVs is a Condition II transient. The FSAR Update Chapter 15 acceptance limit for Condition II transients is 110 percent of design pressure (2750 psia).



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TEXT (17)

PG&E reanalyzed the FSAR Update loss of load/turbine (TRB) trip (LOL/TT) transient without reactor coolant system (RCS)(AB) pressure control at beginning of life using the as-found Unit 1 PSV setpoints tested during the sixth refueling outage. This transient is the limiting FSAR Update Condition II transient for RCS overpressure protection. The RETRAN code was used to perform this analysis. The RETRAN model has been benchmarked against DCPD test data and the FSAR Update LOL/TT transient analysis results. The RETRAN results show that the peak RCS pressure is 2621 psia, which is 129 psi lower than 110 percent of the design RCS pressure (2750 psia). Therefore, it can be concluded that the Unit 1 PSVs with the as-found setpoints can operate normally and provide adequate protection to prevent the RCS from over-pressurization.

Therefore, the health and safety of the public were not affected by this event.

V. Corrective Actions

A. Immediate Corrective Actions

The Unit 1 PSVs were reset at the WSC test facility to the required tolerance using STP M-77.

B. Corrective Actions to Prevent Recurrence

1. This condition has been recognized as an industry-wide problem. PG&E has participated in extensive investigative test programs, both jointly with the WOG and independently. The results of these investigations confirm the adequacy of present test methods and that adequate margin exists to accommodate the identified random setpoint characteristics of the valves.
2. PG&E has identified a design revision to the upper spring washer that, based upon preliminary testing, reduces the random setpoint variance of the valve by approximately 50 percent under controlled test conditions. Based upon discussions with the NRC staff, additional assurance that the PSV's performance is not altered by the design change is recommended. Due to the unavailability of a domestic facility with the capability to perform the recommended valve testing, PG&E has deferred installing PSVs with the modified design.

VI. Additional Information

A. Component: Pressurizer Code Safety Valve
Manufacturer: Crosby Valve and Gauge Company
Model Number: HB-BP-86

B. Previous LERs on Similar Problems



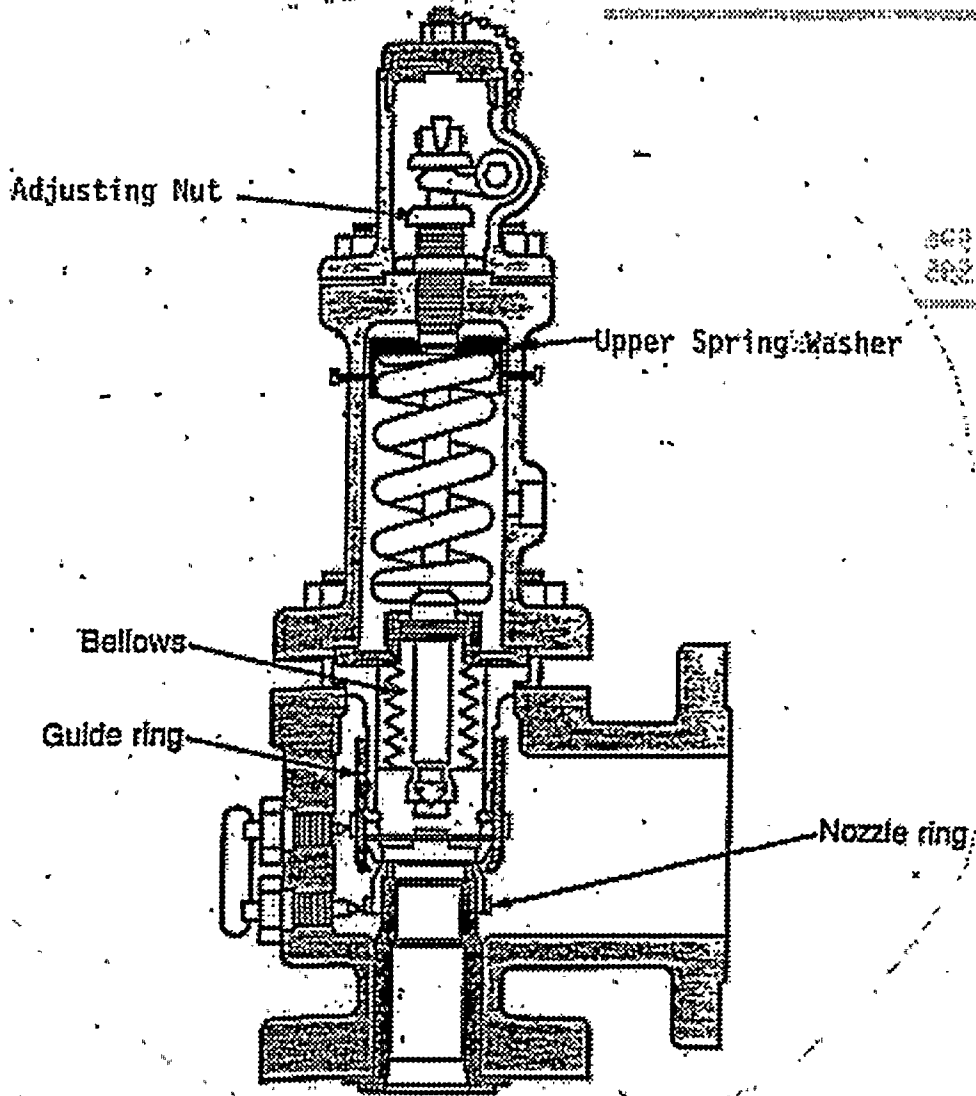
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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (17)

Voluntary LER 1-88-018 was submitted regarding PSVs found outside of TS limits during refueling outages. No root cause or corrective actions could be established for the generic industry problem of setpoint drift of the PSVs. Therefore, the corrective actions taken for LER 1-88-018 did not prevent this event.



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