Pacific Gas and Electric Company

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PG&E Letter DCL-00-147

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

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-2000-009-00
Component Cooling Water Valves Would Not Close Properly due to Misadjusted Travel Stops – Personnel Error

Dear Commissioners and Staff:

PG&E is submitting the enclosed licensee event report regarding Unit 1 component cooling water valves not being properly closed, and therefore, outside design basis due to misadjusted travel stops – personnel error.

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

Sincerely,

D. Mihlusk for DH Oatley
David H. Oatley

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

Enclosure

LMP/2246/N0002117

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Diablo Canyon Unit 1	0 5 0 0 0 2 7 5	1 OF 7

TITLE (4)

Component Cooling Water Valves Would Not Close Properly due to Misadjusted Travel Stops – Personnel Error

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
10	23	2000	2000	- 0 0 9 -	0 0	11	22	2000		

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

LICENSEE CONTACT FOR THIS LER (12)

	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
A	C C	V	F 1 3 0	No					

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 October 25, 2000, at 1230 PDT, with Unit 1 in Mode 6 (Refueling), PG&E determined that the unit had been outside design basis due to excessive component cooling water (CCW) flow in excess of 70 gpm, past valves that would not close properly. A 4-hour nonemergency report was made to the NRC at 1307 PDT, in accordance with 10CFR50.72(b)(2)(i).

Utility engineering personnel discovered two CCW manual butterfly valves not closed properly on October 23, 2000, with the Unit 1 core in the spent fuel pool, while performing a temporary test of CCW System valves.

The two CCW valves were not closed properly due to misadjusted travel stops that allowed the discs to rotate past the valve seats. This condition has apparently existed for the life of the plant and was due to personnel error during installation.

Immediate corrective actions included:

1. Properly closing the two valves,
2. Adjusting their travel stops, and
3. Verifying proper adjustment of travel stops on similar butterfly valves in the CCW System of both units.

Corrective action to prevent recurrence includes requiring maintenance verification testing for similar valves to ensure the travel stops are left properly adjusted after maintenance.

I. Plant Conditions

Unit 1 was in no mode, (defueled) in the tenth refueling outage (1R10).

II. Description of Problem

A. Background

The component cooling water (CCW) System [BI] provides a heat sink for the removal of process and operating heat from safety related and non-safety related components during a design basis accident (DBA) or transient. During normal operation, the CCW System provides this function for safety related components, various nonessential components, and the spent fuel storage pool [DA]. The CCW System serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the Auxiliary Saltwater (ASW) System [BS], and thus to the environment.

The CCW System consists of three CCW pumps powered from separate vital buses, two CCW heat exchangers, and a shared CCW surge tank with a divider plate. The piping system consists of three normally cross-tied headers. The headers extend from the outlet of the heat exchangers, through the header heat loads (components), to the suction of the CCW pumps.

The two vital headers serve redundant engineered safety feature (ESF) loads. A third, nonvital header serves nonvital equipment. Only one ASW pump and one CCW heat exchanger are required, as assumed in the safety analysis, to provide sufficient heat removal from containment to mitigate a DBA. However, to ensure maximum heat removal capability, operators are instructed to place the second CCW heat exchanger in service early in the emergency operating procedures.

Each of the vital headers is separable from the others to mitigate a passive single failure during post-LOCA long term cooling. The divided surge tank is connected to the vital header return piping and is sized to meet system leakage requirements and maintain adequate net positive suction head (NPSH) on system pumps. In the event that CCW System leakage occurs and system makeup is not available, the surge tank volume provides a minimum of 20 minutes, based on a nonmechanistic leakage rate of 200 gpm, for operators to locate and isolate the leak or separate the CCW System into separate loops before the system becomes impaired due to water loss as discussed Supplemental Safety Evaluation Report (SSER) 16,

which did not credit automatic or manual CCW makeup to mitigate a CCW System leak.

For a graphical representation of the CCW System, refer to Figure 1. Additional information on the design and operation of the system, along with a list of the components served, is presented in the Final Safety Analysis Report, Section 9.2.2.

Component Cooling Water System

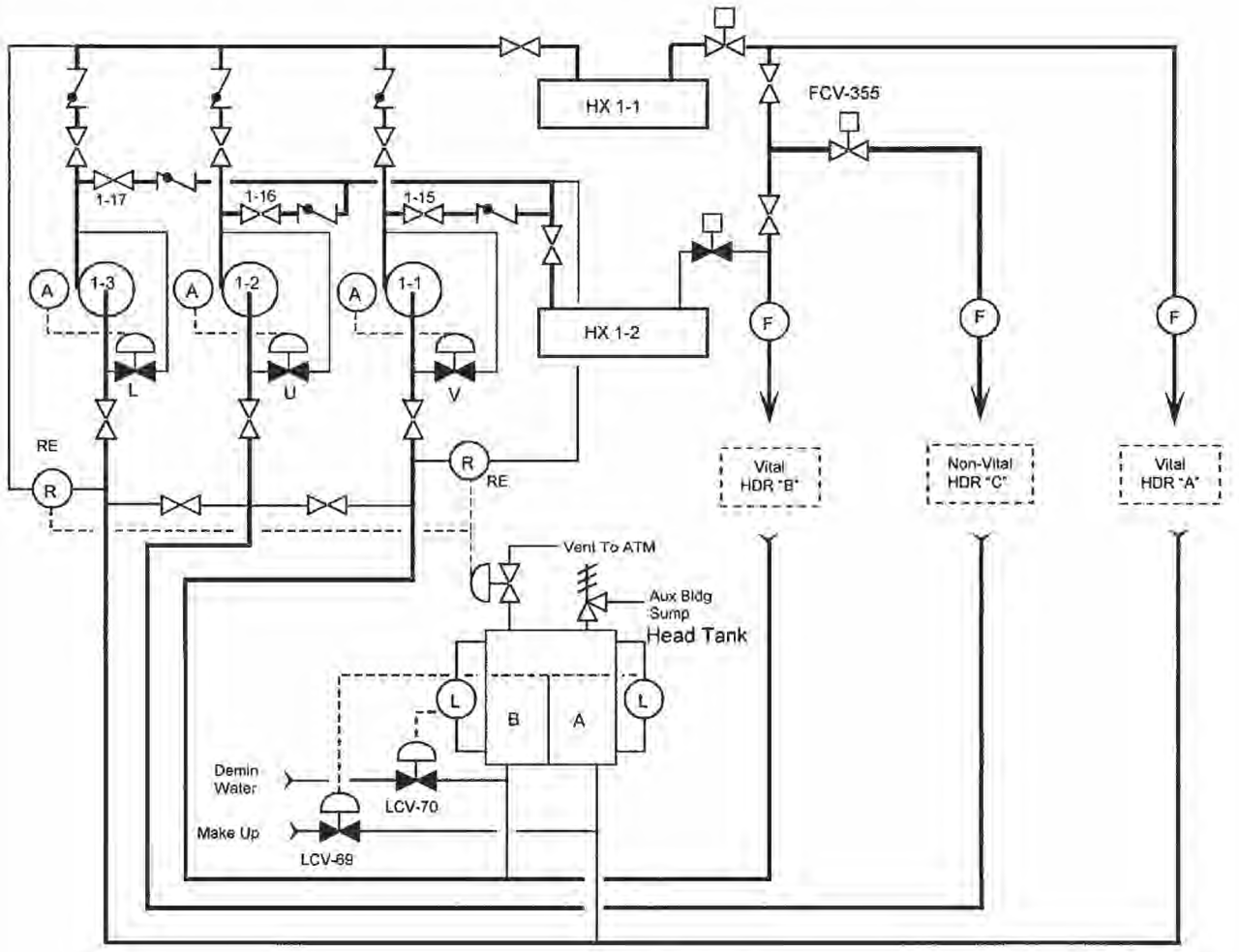

Figure 1

Abnormal Operating Procedure OP AP-11, "Malfunction of Component Cooling Water System" provides direction on various potential system malfunctions including out leakage. When CCW System out leakage is

identified, the first step is to verify that makeup water is available to the CCW surge tank. If the automatic valves malfunction, procedure OP AP-11 directs Operations personnel to operate the manual bypass valves around LCV-69 or LCV-70 to maintain adequate level in the CCW surge tank. If the normal makeup water source is not available, operators are directed to line up water from other sources.

Operating Procedure OP F-2:VII, "Alternate Makeup Water to the CCW System" provides guidance to establish an alternate supply from three different sources. One of the sources consists of only Class I components.

Emergency Operating Procedure EOP E-1.4, "Transfer to Hot Leg Recirculation," directs Operators to align the CCW System into two separate vital headers to minimize the impact of a passive failure in the CCW System during the long term cooling phase of an accident. Automatic or manual makeup, if available, would be used to mitigate out leakage. The Emergency Response Organization would be able to assist in determining the source of the leakage and appropriate system configurations for maintaining cooling.

Temporary Procedure TP TB-0005, "CCW Header B Pump Discharge Valve Seat Leakage Test," was being performed during the Unit 1 tenth refueling outage to address concerns over possible degradation of rubber valve seats in CCW butterfly valves. In order to determine if the valve seats may be degraded, an acceptance criterion of less than 10 gpm of combined valve seat leakage between separated headers was specified to trigger further investigation.

B. Event Description

On October 23, 2000, TP TB-0005 was performed with initial results showing in excess of 70 gpm cumulative flow past three manual butterfly valves. The flow past the valves prevented complete separation of the vital headers. Manual butterfly valves CCW-1-15 and CCW-1-17 were found with their discs rotated past their seats, thus not fully closed. After the two valves were adjusted so that their discs were on their seats, the test was performed and leakage was measured at less than 1 gpm.

On October 25, 2000, at 1230 PDT, after evaluating the initial test results against the design and licensing basis, PG&E determined the failure to separate the vital headers was outside the design basis and a 4-hour nonemergency report was made to the NRC at 1307 PDT, in accordance

with 10CFR50.72(b)(2)(i). This determination was based on the evaluation in SSER 16, which credited only operator action to isolate a postulated CCW leak and did not credit automatic or manual CCW makeup.

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

None

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery

The utility test engineers performing TP TB-0005 discovered the valves would not close properly while attempting to measure seat leakage. The engineers estimated the flow rate to be between 70 and 100 gpm.

F. Operator Actions

None

G. Safety System Responses

None

III. Cause of the Problem

A. Immediate Cause

Investigations showed butterfly valves CCW-1-15 and CCW-1-17 would not close properly due to misadjusted travel stops. When the valves were initially closed for the test, the discs were over rotated past the seats by approximately 2 degrees before the travel stops engaged.

B. Root Cause

The apparent root cause of the misadjusted travel stops for these valves is personnel error. Based on a lack of evidence of related maintenance, the travel stops were apparently left misadjusted during initial installation, prior to plant startup.

TEXT

IV. Analysis of the Event

The CCW System is required to provide cooling to safety-related components to assure that they are capable of performing their required functions following an accident. As previously described, the CCW System consists of normally cross-tied vital and nonvital headers. The headers can be isolated from each other within 20 minutes following an assumed CCW leak of 200 gpm, as discussed in SSER 16.

Had a 200 gpm leak occurred in header B, and makeup was not available, the leakage would not have been terminated when the subject valves were closed. Left uncorrected, the ongoing out leakage would result in a loss of the CCW function.

However, the combination of operator action and the addition of makeup water would maintain the CCW function. Makeup would allow sufficient time for operators to identify leakage paths and isolate the headers. Makeup is automatically available through valves LCV-69 and 70, which open on low tank level, to provide normal 250 gpm makeup to the CCW surge tank. There are also Class I manual bypass valves around LCV-69 and LCV-70 and an alternate Class I makeup alignment to allow manual makeup.

Thus, given a 200 gpm leak and if valves CCW-1-15 and CCW-1-17 would not close properly to completely separate the headers, the resultant cross header leakage of more than 70 gpm would have been completely mitigated.

Therefore, the CCW System was capable of performing its required safety function. There were no actual safety consequences involved in this event because CCW makeup capability was available and in excess of the postulated leakage.

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

The condition is not a Safety System Functional Failure.

The event was evaluated using the NRC's Significance Determination Process in accordance with NRC Inspection Manual Chapter 0609 and was screened out as green.

V. Corrective Actions

A. Immediate Corrective Actions

1. Valves CCW-1-15 and CCW-1-17 were manually adjusted to reduce cumulative leakage to less than 1 gpm.
2. The travel stops for these two valves were adjusted to ensure the valves discs stop on the seat.
3. Similar valves on both Units were evaluated or inspected. If there was no evidence that the valves had recently been used in a clearance boundary where excess leakage would have been identified, the valves were inspected to verify their travel stops were in the correct position.
4. Based on the above inspection, travel stops were adjusted on several additional Unit 1 valves.

B. Corrective Actions to Prevent Recurrence

PG&E will require maintenance verification testing for similar valves to ensure the travel stops are left properly adjusted after maintenance.

VI. Additional Information

A. Failed Components

The valves are manual 20-inch butterfly valves, made of carbon steel with rubber seats.
Manufacturer: Fisher Controls Company
Model number: 9170

B. Previous Similar Events

None