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AUTH.NAME AUTHOR AFFILIATION
HUG,M.T. Pacific Gas & Electric Co.
RUEGER,G.M. Pacific Gas & Electric Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-006-01:on 910926,leakage of approx 1.3 gpm noted from diaphragm valves CVCS-2-8471 & CVCS-2-548 in charging pump suction line.Caused by personnel error.Preventive maint program will be revised.W/920424 ltr.

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Pacific Gas and Electric Company

77 Beale Street
San Francisco, CA 94106
415/973-4684

Gregory M. Rueger
Senior Vice President and
General Manager
Nuclear Power Generation

April 24, 1992

PG&E Letter No. DCL-92-086

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

Re: Docket No. 50-323, OL-DPR-82
Diablo Canyon Unit 2
Licensee Event Report 2-91-009-01
10 CFR 100 Dose Limits Potentially Exceeded in the Event of a Design Basis Loss of Coolant Accident Recovery as a Result of Valve Leakage

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(ii)(B), PG&E is submitting the enclosed revision to Licensee Event Report (LER) 2-91-009-00. This revision is being submitted to report the results of PG&E's investigation into the root cause of this event and the determination of applicable corrective actions.

Sincerely,

Gregory M. Rueger

cc: Ann P. Hodgdon
John B. Martin
Philip J. Morrill
Harry Rood
CPUC
Diablo Distribution
INPO

DC2-91-TN-N087

Enclosure

5714S/85K/PJT/2246

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
DIABLO CANYON UNIT 2	0 5 0 0 0 3 2 3	1 OF 6

TITLE (4) 10 CFR 100 DOSE LIMITS POTENTIALLY EXCEEDED IN THE EVENT OF A DESIGN BASIS LOSS OF COOLANT ACCIDENT RECOVERY AS A RESULT OF VALVE LEAKAGE

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	DOCKET NUMBER (S)
09	26	91	91	- 0 0 9 -	0 1	04	24	92		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N
POWER LEVEL (10)	0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (11)

X 10 CFR 50.73(a)(2)(ii)(B)

___ OTHER - ___

(Specify in Abstract below and in text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER AREA CODE	TELEPHONE NUMBER
MARTIN T. HUG, SENIOR REGULATORY COMPLIANCE ENGINEER	805	545-4005

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	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	EAR
| | YES (if yes, complete EXPECTED SUBMISSION DATE)	| X | NO				

ABSTRACT (16)

On September 26, 1991, with Unit 2 defueled, leakage of approximately 1.3 gallons per minute (gpm) was identified from diaphragm valves CVCS-2-8471 and CVCS-2-548 in the charging pump suction line during the performance of a hydrostatic test. The diaphragms in both valves were replaced and the valves tested satisfactory.

On October 4, 1991, at 1645 PDT, an evaluation of the leakage discovered September 26, 1991, determined that the control room and exclusion area boundary 10 CFR 100 dose limits could be potentially exceeded during the design basis recirculation phase of loss of coolant accident (LOCA) recovery. On October 4, 1991, at 1800 PDT, a four-hour, non-emergency report was made to the NRC in accordance with 10 CFR 50.72(b)(2)(i).

The root cause of body-to-bonnet leakage in valve CVCS-2-8471 was personnel error in that the valve was not included in the plant preventive maintenance program. The root cause of body-to-bonnet leakage from valve CVCS-2-548 could not be determined.

The preventive maintenance program will be revised to include diaphragm replacement frequency and bolt torquing for diaphragm valves.

I. Plant Conditions

Unit 2 was defueled at the time of the event as part of the Unit 2 fourth refueling outage.

II. Description of Event

A. Event:

Summary

On October 4, 1991, at 1645 PDT, with Unit 2 defueled, an evaluation determined that leakage from valves CVCS-2-548 and CVCS-2-8471 could have resulted in the control room (NA) and exclusion area boundary 10 CFR 100 dose limits being exceeded during the recirculation phase of recovery from a design basis loss of coolant accident (LOCA). CVCS-2-548 and CVCS-2-8471 are located in the chemical and volume control system (CVCS) (CB).

Discussion

On September 26, 1991, a hydrostatic test was performed during a scheduled refueling outage, following installation of a new valve in the CVCS. The hydrostatic test pressurized the charging pump (BQ)(P) suction line portion of the CVCS.

During the performance of the hydrostatic test, diaphragm valves CVCS-2-548 (CB)(V) and CVCS-2-8471 (CB)(V) were identified to be leaking. The identified leakage was coming from between the valve body and bonnet on both valves. Leakage from both valves was estimated to be approximately 1.3 gallons per minute (gpm) total.

CVCS-2-548 and CVCS-2-8471 are located in the boric acid blender (CB)(MIX) room on the 100 foot elevation of the auxiliary building (NF). Both valves are pressurized during post-LOCA recirculation. The boric acid blender room ventilation exhausts to the plant vent without passing through charcoal filters (VF)(FLT). Therefore, any radioactive material that may be released as a result of leakage from these valves would be released to the plant vent filtered only by HEPA filters.

On October 4, 1991, at 1645 PDT, evaluation of the hydrostatic test data was performed to confirm the leak rates and post-LOCA recirculation pressure. The evaluation determined that leakage from CVCS-2-548 and CVCS-2-8471 could have resulted in the control room and exclusion area boundary 10 CFR 100 dose limits being exceeded during the recirculation phase of recovery from a design basis LOCA.

On October 4, 1991, at 1800 PDT, a four-hour, non-emergency report was made to the NRC in accordance with 10 CFR 50.72(b)(2)(i).

Similar tests were performed during previous Units 1 and 2 refueling outages, but no similar problems were identified.

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

Leakage through CVCS-2-548 and CVCS-2-8471 caused the event.

C. Dates and Approximate Times for Major Occurrences.

1. September 26, 1991: Event date - CVCS-2-8471 and CVCS-2-548 were observed to be leaking during the performance of a hydrostatic test.

2. October 4, 1991, 1645 PDT: Discovery date - The results of an evaluation indicated that the leak from CVCS-2-548 and CVCS-2-8471 could cause the control room and exclusion area boundary 10 CFR 100 dose limits to potentially be exceeded during the recirculation phase of LOCA recovery.

3. October 4, 1991, 1800 PDT: A four-hour, non-emergency report was made to the NRC in accordance with 10 CFR 50.72(b)(2)(i).

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

Test engineers observed leakage while performing a hydrostatic test.

F. Operators Actions:

None.

G. Safety System Responses:

None.

III. Cause of the Event

A. Immediate Cause:

The immediate cause of the plant being outside of its design basis was body-to-bonnet leakage from CVCS-2-548 and CVCS-2-8471.

B. Root Cause:

1. The root cause of body-to-bonnet leakage in CVCS-2-8471 was personnel error in that the valve was not included in the plant preventive maintenance (PM) program. Since the valve was not included in the PM program, the diaphragm's service life was exceeded.

2. Although the specific root cause of body-to-bonnet leakage from CVCS-2-548, which was included in the PM program, could not be determined, the failure to include vendor recommendations on retorquing bonnet bolts in the PM program may have been a factor in the root cause.

IV. Analysis of the Event

A leak of 1.3 gpm in the auxiliary building filtered only by HEPA filters could potentially have resulted in control room operator thyroid dose exceeding the 10 CFR 50 Appendix A General Design Criteria 19 limit over the 30-day duration of the design basis LOCA.

However, post-LOCA emergency response procedures provide for use of self-contained breathing apparatus (SCBAs) and potassium iodide prophylaxis, which would mitigate control room operator thyroid dose. Control room radiation conditions would be monitored by area radiation monitors located in the control room. Although the monitors are design Class II, they are powered from Class 1E power supplies. The area radiation monitors would provide sufficient indication to allow control room operators to don SCBA equipment or take additional corrective measures.

A leak of 1.3 gpm from the auxiliary building filtered only by the HEPA filters could potentially have resulted in exceeding the 10 CFR 100 2-hour site boundary dose limit to the thyroid.

A design basis LOCA dose analysis contains many conservative assumptions, particularly with regards to source term (i.e. fuel damage), therefore an analysis was peformed by PG&E using "expected case" LOCA assumptions (no fuel damage). The analysis determined that a 1.3 gpm leak would result in a 2-hour site boundary thyroid dose of approximately 0.5 rem, which is well below the 10 CFR 100 limit. Therefore, public health and safety were not affected by this event.

V. Corrective Actions

A. Immediate Corrective Actions:

The diaphragms for CVCS-2-548 and CVCS-2-8471 were replaced and the valves were successfully tested to assure that body-to-bonnet leakage did not occur.

B. Corrective Actions to Prevent Recurrence:

1. Maintenance Procedure M-51.7, "Grinell Diaphragm Valve Maintenance," will be revised to include vendor recommendations on diaphragm replacement frequency and bolt torquing for diaphragm valves.

2. A review of installed diaphragm valves was made to ensure that all applicable valves are included in the diaphragm replacement PM program.

VI. Additional Information

A. Failed Components:

None.

B. Previous LERs on Similar Events:

LER 1-90-010-00 Control Room Post-LOCA Habitability Design Basis Potentially Exceeded Due to Leakage Through a Vibration Induced Crack in CVCS Piping

This LER addressed the leakage of post-LOCA coolant into the charging pump rooms. The leakage would have resulted in exceeding the control room design basis dose limit. The cause of the event was determined to be a high cycle fatigue crack in the suction line of the nonsafety-related charging pump.

The corrective actions for the event included repairing the crack, adding additional supports to the suction line, and revising emergency procedures to assure that the auxiliary building ventilation system (VF) is in the safeguards mode of operation, and consequently, exhaust from the charging pump rooms is filtered, after a LOCA.

These corrective actions would not have prevented the leakage from CVCS-2-548 and CVCS-2-8471. The requirement for assuring that the auxiliary building ventilation system is in the safeguards mode would not have prevented the control room or exclusion area boundary dose limit from being exceeded in the event of a LOCA because the boric acid blender room is not part of the safeguards ventilation flowpath.