



**Pacific Gas and
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November 24, 1999

PG&E Letter DCL-99-142

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 2-1999-003-00
Entry Into Technical Specification 3.0.3 Due to Voiding in the Emergency Core
Cooling System Caused by Inadequate Administrative Controls

Dear Commissioners and Staff:

PG&E is submitting the enclosed licensee event report regarding entry into Technical Specification 3.0.3 due to voiding in the emergency core cooling system. On November 16, 1999, after discussions with the NRC staff, this event was reported as a 4-hour non-emergency event in accordance with 10 CFR 50.72 (b)(2)(iii)(D).

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

Sincerely,

David H. Oatley

cc: Steven D. Bloom
Ellis W. Merschoff
David L. Proulx
Diablo Distribution
INPO

Enclosure

TLH/2246/N0002076

IE22

PDR AD000 05000323

LICENSEE EVENT REPORT (LER)

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TITLE (4)
Entry Into Technical Specification 3.0.3 Due to Voiding in the Emergency Core Cooling System Caused by Inadequate Administrative Controls

EVENT DATE (5) 10 26 1999				LER NUMBER (6) 1999 - 0 0 3 - 0 0				REPORT DATE (7) 11 26 1999			OTHER FACILITIES INVOLVED (8)							
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MO	DAY	YEAR	FACILITY NAME					DOCKET NUMBER				

OPERATING MODE (9) 3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (11) <input checked="" type="checkbox"/> 10 CFR 50.73(a)(2)(i)(B) and 50.72(b)(2)(iii)(D) <input type="checkbox"/> OTHER _____ (SPECIFY IN ABSTRACT BELOW AND IN TEXT, NRC FORM 366A)
POWER LEVEL (10) 0 0 0	
LICENSEE CONTACT FOR THIS LER (12)	

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

SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	EXPECTED SUBMISSION DATE (15) <input checked="" type="checkbox"/> NO
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ABSTRACT (Limit to 1400 spaces. i.e., approximately 15 single-spaced typewritten lines.) (16)

On October 26, 1999, at 0015 PDT, with Unit 2 in Mode 3 (Hot Standby), at 0 percent power, Technical Specification (TS) 3.0.3 was entered due to voiding in the emergency core cooling system piping. Approximately 0.9 ft³ of air was identified by the ultrasonic test (UT) monitor near Valves 8807 A/B. The void was vented and TS 3.0.3 was exited on October 26, 1999, at 0040 PDT. A review of the temporarily installed UT monitor tape indicated that the void formed on October 25, 1999, at 2127 PDT. Therefore, the plant was in a TS 3.0.3 condition for approximately 3 hours 13 minutes. On November 16, 1999, at 1321 PST, PG&E made a 4-hour nonemergency notification to the NRC in accordance with 10 CFR 50.72(b)(2)(iii)(D).

The void was caused by the introduction and transport of air during outage activities. Fill and vent procedures did not specifically address filling and venting sections of excess letdown piping.

The temporary UT monitoring equipment will remain functional during applicable parts of outages and for an appropriate time after outages to monitor the ECCS for voiding. The monitoring equipment will remain in use until PG&E is confident that it is no longer needed. Additional steps have been taken to observe the installed monitor on a more frequent basis during the transition from refueling outages to operation.

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TEXT

I. Plant Conditions

Unit 2 was in Mode 3 (Hot Standby) at 0 percent power.

II. Description of Problem

A. Summary

On October 26, 1999, at 0015 PDT, with Unit 2 in Mode 3, Technical Specification (TS) 3.0.3 was entered due to voiding in the emergency core cooling system (ECCS)(BQ) piping (PSP). Approximately 0.9 ft³ of air was identified by the ultrasonic test (UT) monitor near Valves 8807 A/B. The void was vented and TS 3.0.3 was exited on October 26, 1999, at 0040 PDT. A review of the temporarily installed UT monitor tape indicated that the void formed on October 25, 1999, at 2127 PDT. Therefore, the plant was in a TS 3.0.3 condition for approximately 3 hours 13 minutes. On November 16, 1999, at 1321 PST, PG&E made a 4-hour nonemergency notification to the NRC in accordance with 10 CFR 50.72(b)(2)(iii)(D).

B. Background

Surveillance Test Procedure (STP) M-89A, "Void Volume Measurement in SIP/CCP Suction Crosstie Piping," performs weekly monitoring of the ECCS for voids. Step 12.8 states: "If the total void volume exceeds the allowable void volume in Step 12.4, notify Operations to immediately enter Tech Spec 3.0.3 (ITS 3.0.3) and to perform venting at SI-187 (Unit 1), SI-254 and SI-255 (Unit 2) and/or SI-125 per the applicable steps of STP M-89, as required. Time of Tech Spec entry should be time that first data was obtained indicating excess void volume." This procedure is performed on a weekly basis.

STP M-89, "ECCS System Venting," demonstrates operability by venting the ECCS pumps and system high points on a monthly basis.

Temporary Procedure TB-9912, "Unit 2 Ultrasonic Testing of ECCS Piping," performs UT of the ECCS piping prior to and following the transition to Mode 4 (Hot Shutdown) when resuming power operation after an outage. The procedure is performed by the Inservice Inspection (ISI) group. The rate of UT testing may vary depending on input from Engineering and Operations personnel, knowledge of void growth, and outage related activities that could introduce air in the ECCS. TB-9912 monitors more

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TEXT

system piping sections than STP M-89A.

PG&E continues to use temporary data acquisition equipment in the unit completing the outage to help determine the source and size of gas voiding. The equipment constantly monitors the piping area adjacent to Valves 8807A/B in the ECCS piping using UT. The constant monitoring equipment is supplemented by periodic UT using STP M-89A.

C. Event Description

On September 30, 1999, sections of the letdown and seal water return piping were drained for leak rate testing. See attached drawing.

From September 30 to October 19, 1999, the piping remained drained for various testing and maintenance activities.

On October 19, 1999, Operations filled the excess letdown heat exchanger (HX) discharge line. Normally the piping downstream of Valve 8143 to the seal water return line would be part of the fill and vent path. However, in this case, the Valve 8143 was aligned to the reactor coolant drain tank because of work on Valve 8112. Therefore, the line was not filled and vented.

On October 20, 1999, Operations filled the seal water return piping. Significant amounts of air were noted during the vent process.

On October 22, 1999, at 0845 PDT, UT in accordance with TB-9912 was started to monitor various locations within the ECCS for voiding. STP M-89 was performed to vent the ECCS.

On October 23, 1999, at 0300 and 0810 PDT, UT monitoring in accordance with TB-9912 and STP M-89A was performed and indicated that the ECCS was full. The constant monitoring equipment remained energized, but was not periodically observed by Operations personnel. Observation by Operations was not required based on the successful completion of STP M-89, STP M-89A, and TB-9912.

On October 24, 1999, at 0200, Unit 2 entered Mode 4.

On October 25, 1999, at 0400, Unit 2 entered Mode 3.

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On October 25, 1999, at 2122 PDT excess letdown was initiated to support ISI pressure tests.

On October 25, 1999, at 2127 PDT, entrapped air near the excess letdown HX was transported toward the suction of the centrifugal charging pumps (CCPs). Air accumulated upstream of Valves 8807 A/B in the ECCS suction crosstie piping because this location is a high point in the piping configuration. The void was approximately 0.9 ft³ which exceeded the STP M-89A acceptance criteria.

On October 26, 1999, at 0015 PDT, the void was discovered by an ISI engineer during a nonroutine observation. The engineer was in the area to inspect piping during unrelated testing. The engineer was familiar with the monitoring equipment at Valve 8807 A/B, noted the condition, and immediately notified the control room.

On October 26, 1999, at 0015 PDT, Operations personnel immediately entered TS 3.0.3 and vented the line.

On October 26, 1999, at 0040 PDT, STP M-89A void acceptance criteria for size was met and TS 3.0.3 was exited.

On October 26, 1999, at 0345 PDT, UT was performed in accordance with TB-9912 with no evidence of voiding.

On October 27, 1999, at 1430 PDT, UT was performed in accordance with TB-9912 with no evidence of voiding.

On November 16, at 1321, PST, PG&E made a 4-hour notification to the NRC in accordance with 10 CFR 50.72(b)(2)(iii)(D). The notification was made after a telecommunication with the NRC. The staff indicated that the loss of both trains in a safety system is reportable under 10 CFR 50.72(b)(2)(iii)(D), even if the inoperable system did not prevent the fulfillment of a safety function. At DCPD both CCPs and safety injection pumps (SIPs) are subsystems in the ECCS. During the injection and recirculation phases of a loss of coolant accident, all four pumps are required to be operable.

In previous analyses, documented in letters DCL-99-091, "Emergency Core Cooling System Outside Design Basis Due to Gas Voiding in the Suction Piping," and DCL-99-101, "Response to Apparent Violations in Inspection

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Report Nos. 50-275/99-07 and 50-323/99-07," dated July 23 and August 26, 1999, respectively, PG&E postulated that either both CCPs or both SIPs could become inoperable during the switchover from ECCS injection to recirculation due to air binding caused by voiding. The analyses also indicated that any one of the four pumps could assure the recirculation function without exceeding the peak clad temperature limit. However, since either both CCPs or SIPs could become inoperable, the event is reportable under 10 CFR 50.72(b)(2)(ii) as a condition that alone could have prevented the fulfillment of the safety function designed to mitigate the consequences of an accident.

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

None.

E. Dates and Approximate Times for Major Occurrences

1. October 25, 1999, 2127 PDT: Historical data determined that a void formed at Valves 8807 A/B.
2. October 26, 1999, 0015 PDT: Entered TS 3.0.3.
3. October 26, 1999, 0040 PDT: Exited TS 3.0.3.
4. November 16, 1999, 1321 PST: NRC was notified of the event in accordance with 10 CFR 50.72 (b)(2)(iii)(D).

F. Other Systems or Secondary Functions Affected

None.

G. Method of Discovery

The void was discovered by an ISI engineer during a nonroutine observation.

H. Operator Actions

None.

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I. Safety System Responses

None.

III. Cause of the Problem

A. Immediate Cause

TS 3.0.3 was entered because either both CCPs or both SIPs are considered inoperable with a void in the ECCS crosstie piping in excess of STP M-89A limits.

B. Root Cause

The void was caused by the introduction and transport of air during outage activities. Fill and vent procedures did not specifically address filling and venting sections of excess letdown piping.

IV. Analysis of the Event

The voiding condition and safety impact were previously evaluated. The evaluation is described in DCL-99-101 dated August 26, 1999. The evaluation concluded that the public health and safety were not adversely affected.

The evaluation also indicated that, when the condition was evaluated under the NRC's Significance Determination Process, the condition screened out as "green."

V. Corrective Actions

A. Immediate Corrective Actions

The void was vented in accordance with approved procedures.

B. Corrective Actions to Prevent Recurrence

1. The response to Notices of Violation in NRC Inspection Report 50-275/99-07; 50-323/99-07 indicated that PG&E had performed an evaluation of "possible gas sources such as degassing or migration and concluded no possibility of local gas formation." This evaluation focused

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TEXT

on activities within the ECCS and emergency boration lineups that were considered routine operations e.g., surveillances such as running ECCS pumps in recirculation mode and normal vent and fill processes during the refueling outages. The evaluation of other sources of voiding has been performed periodically based on industry information or as a result of DCPD experience. For example, engineering identified the need to provide precautions in the procedure for batching boric acid to prevent introducing air into the system which could damage the safety-related boric acid transfer pumps.

Following this event, an additional evaluation was performed by Engineering and Operations which closely scrutinized all of the piping that ties into the CCP suction header line and the activities associated with that piping. The evaluation identified certain locations outside of the ECCS, but within the chemical volume control system, where voids could be present. As a result, administrative clearances were implemented until the locations could either be verified full, or vented, and additional procedures evaluated. PG&E recognizes that all conceivable activities and system configurations cannot be anticipated. As part of the operational experience review program, PG&E continues to review operational, maintenance, and testing activities which could introduce air into the ECCS suction line.

2. The temporary UT monitoring equipment will be functional during applicable parts of outages and for an appropriate time after outages to monitor the ECCS for voiding. As previously stated in DCL-99-091, the monitoring equipment will remain in use until PG&E is confident that it no longer needed.
3. Additional steps have been taken through the use of operations standing/shift orders to observe the installed monitor on a more frequent bases during the transition from refueling outages to power operation.
4. PG&E is evaluating the excess letdown piping configuration to determine the actions needed to assure the line is adequately filled and vented.

VI. Additional Information

A. Failed Components

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None.

B. Previous Similar Events

Voiding in the ECCS was previously identified in LER 1-98-011-00 and supplements dated December 16, 1998, and July 23, 1999, respectively. The causes for previous voids were determined to be insufficient system filling and venting, and piping configuration. Corrective actions included procedure revisions to enhance filling and venting, the evaluation of piping configurations in the ECCS, and the installation of vents to facilitate the removal of voids once they occurred.

One of the primary causes for the most recent voiding event was that existing fill and vent procedures did not adequately vent the excess letdown piping. Although the local leak rate testing and resultant valve alignments are performed infrequently (approximately every 40 months), the procedure was considered inadequate.

PG&E has evaluated numerous scenarios that could effect operation of the ECCS. These evaluations continue to be performed, as part of the corrective actions for LER 1-98-011-01 and Notices of Violation in Inspection Reports 50-275/99-07; 50-323/99-07. As discussed in Section V.B.1., PG&E has identified specific scenarios and taken corrective actions based on industry information and its own experience. Although the evaluations did not identify and consider the specific scenario identified in this report, the evaluations were reasonable when considering the safety significance of the condition and the other significant corrective actions taken (e.g., installation of vents, operational procedure changes) to eliminate or significantly reduce voiding in the ECCS in a timely manner.

