

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9207280090 DOC. DATE: 92/07/20 NOTARIZED: NO DOCKET #
 FACIL: 50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275
 AUTH. NAME AUTHOR AFFILIATION
 THIERRY, R.L. Pacific Gas & Electric Co.
 RUEGER, G.M. Pacific Gas & Electric Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-007-00: on 920620, CR ventilation sys manually shifted to pressurization mode & acid/caustic spill caused chemical mist to enter portions of turbine bldg. Caused by personnel error. Operator counseled & design changes made. W/920720 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 9
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES L TTR ENCL	RECIPIENT ID CODE/NAME	COPIES L TTR ENCL
	PD5 LA	1 1	PD5 PD	1 1
	ROOD, H	1 1		
INTERNAL:	ACNW	2 2	ACRS	2 2
	AEOD/DOA	1 1	AEOD/DSP/TPAB	1 1
	AEOD/ROAB/DSP	2 2	NRR/DET/EMEB 7E	1 1
	NRR/DLPQ/LHFB10	1 1	NRR/DLPQ/LPEB10	1 1
	NRR/DOEA/OEAB	1 1	NRR/DREP/PRPB11	2 2
	NRR/DST/SELB 8D	1 1	NRR/DST/SICB8H3	1 1
	NRR/DST/SPLB8D1	1 1	NRR/DST/SRXB 8E	1 1
	REG FILE 02	1 1	RES/DSIR/EIB	1 1
	RGNS FILE 01	1 1		
EXTERNAL:	EG&G BRYCE, J.H	2 2	L ST LOBBY WARD	1 1
	NRC PDR	1 1	NSIC MURPHY, G.A	1 1
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Pacific Gas and Electric Company

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

July 20, 1992

PG&E Letter No. DCL-92-160



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

Re: Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Licensee Event Report 1-92-007-00
Missed Fire Watch and Manual Engineered Safety Feature Actuation
from Chemical Spill Due to Personnel Error

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(iv), PG&E is submitting the enclosed Licensee Event Report describing an event that led to (1) a violation of Technical Specification 3.7.10 when an hourly fire watch patrol in safety-related equipment rooms was not performed, and (2) a control room ventilation system shift from its normal ventilation mode to the pressurization mode (an Engineered Safety Feature actuation). This event was caused by personnel error.

This event has in no way affected the health and safety of the public.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Greg Rueger', written over a horizontal line.

Gregory M. Rueger

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

DC2-92-OP-N029

Enclosure

5825S/85K/SDL/2246

9207280090 920720
PDR ADDCK 05000275
S PDR

Handwritten initials or a signature in the bottom right corner of the page, possibly reading 'JH' or similar.



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) DIABLO CANYON UNIT 1						DOCKET NUMBER (2) 0 5 0 0 0 2 7 5 1					PAGE (3) 1 OF 8		
TITLE (4) MISSED FIRE WATCH AND MANUAL ENGINEERED SAFETY FEATURE ACTUATION FROM CHEMICAL SPILL DUE TO PERSONNEL ERROR													
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 (8)		
06	20	92	92	- 0 0 7	- 0 0	07	20	92	DIABLO CANYON UNIT 2		0 5 0 0 0 3 2 3		
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (11)											
POWER LEVEL (10)		<input checked="" type="checkbox"/> 10 CFR <u>50.73(a)(2)(i)(B) and 50.73(a)(2)(iv)</u> <input type="checkbox"/> OTHER _____ (Specify in Abstract below and in text, NRC Form 366A)											

LICENSEE CONTACT FOR THIS LER (12)								TELEPHONE NUMBER			
RAYMOND L. THIERRY, SENIOR REGULATORY COMPLIANCE ENGINEER								AREA CODE 805		NUMBER 545-4004	

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	
A				N							

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

ABSTRACT (16).

On June 20, 1992, at 1800 PDT, with Units 1 and 2 in Mode 1 (Power Operation) at 100 percent power, the action statement for Technical Specification 3.7.10 was not met for Units 1 and 2. At 1821 PDT, the control room ventilation system was manually shifted from the normal operation mode to the pressurization mode. This mode shift is an Engineered Safety Feature actuation.

On June 20, 1992, at 1718 PDT, during a condensate demineralizer resin regeneration, an acid/caustic spill caused a chemical mist to enter portions of the turbine building. As a prudent personnel safety measure, the turbine building was evacuated and the roving 1-hour fire watch was discontinued. The 1-hour fire watches were resumed at 0210 PDT on June 21, 1992.

The root cause of the event was personnel error. In order to save time, the non-licensed operator consciously decided to fill the acid and caustic day tanks simultaneously, although the Operating Procedure cautions that only one day tank be filled at a time.

The corrective actions for the event include counseling of the operator, preparation of an incident summary of the event and reviewing it with control operators, and design changes to the condensate polisher system.



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I. Plant Conditions

Units 1 and 2 were in Mode 1 (Power Operation) at 100 percent power.

II. Description of Event

A. Summary:

On June 20, 1992, at 1718 PDT, during a condensate demineralizer (KD) resin regeneration, approximately 700 gallons of chemicals were spilled when the caustic and acid day tanks (KD)(VLR) were overfilled during chemical transfer operations. Since the tanks overflow into a common bermed area, the subsequent chemical reaction yielded a cloud of steam and entrained chemicals.

The chemical spill resulted in activation of the plant fire brigade and an assistance call to the California Department of Forestry. Most areas of the Units 1 and 2 turbine building were evacuated as a precautionary measure, and Unit 2 was placed in an Unusual Event status.

On June 20, 1992, at 1800 PDT, the action statement for Technical Specification (TS) 3.7.10 was not met for Units 1 and 2 when the required hourly fire watch was not performed. At 1821 PDT, the control room ventilation system (CRV) was manually shifted from normal operation to the pressurization mode. This mode shift is an Engineered Safety Feature (ESF) actuation.

B. Background:

The condensate polishing system is part of the secondary plant chemistry control (SD). It is designed to maintain the chemical requirements for condensate water in order to ensure a chemically favorable environment in the steam generators (TB)(SG). A 93% solution of sulfuric acid and a 50% solution of sodium hydroxide are used in the resin regeneration process. The caustic regeneration system consists of a caustic storage tank, caustic day tank, caustic regeneration pumps (KD)(P), caustic heat exchanger (KD)(HX), and associated valves (KD)(V) and piping (KD)(PSX). The acid regeneration system consists of an acid storage tank, acid day tank, acid regeneration pumps, and associated valves and piping.

The control system (KD)(LIC) for the condensate polishers is equipped with a computer system (KD)(CPU), which records valve positions as well as high level alarms from the day tanks. The alarms are displayed via printed messages on both computer monitor (KD)(MON) and printer (KD)(PRNT). There are no audible alarms in the polisher office and no local alarms at the day tanks.



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TS 3.7.10 requires that an hourly fire watch and operable fire detection (IC) be provided for fire barrier impairments. The following areas were required to have an hourly fire watch in accordance with this TS: The Unit 1 component cooling water (CCW) heat exchanger (H/X)(BI)(HX) room, Units 1 and 2 diesel generator (EA)(GEN) fire areas, Unit 1 4 KV switchgear (EA)(SWGR) and cable spreading (FA) areas, Unit 1 12 KV switchgear and cable spreading areas, and Unit 2 85-ft CCW H/X Room.

The CRV has four modes of operation. Mode 1 is normal operation and Mode 4 is high radiation/phase "A" pressurization. In mode 4, the ventilation system is designed to isolate and pressurize the control room by filtering air through the HEPA/charcoal filter (VI)(FLT). This action also pressurizes the Technical Support Center (TSC) (NM)(VLR) ventilation.

C. Event Description:

On June 20, 1992, a Unit 2 condensate demineralizer resin regeneration was in progress. At approximately 1635 PDT, a non-licensed auxiliary control operator (ACO) began a series of resin regeneration steps. The ACO was concerned with saving time and turning over his watchstation to the next shift with the regeneration sequence incomplete. Knowing the next series of resin regeneration steps would take about 10 minutes, the ACO decided to complete the unrelated task of filling the acid and caustic day tanks simultaneously, disregarding the precaution in Operating Procedure OP C-7C:IV, "Operating Procedure Condensate Polishing System Resin Bed Regeneration." Filling of the acid and caustic day tanks normally takes about 10 to 15 minutes for the acid tank and 15 to 20 minutes for the caustic tank. Following initiation of the day tank filling process, the ACO continued with the next step in the resin regeneration process. During that evolution, he forgot about the day tank filling process.

On June 20, 1992, between 1650 PDT and 1705 PDT, following completion of resin cleaning procedure OP C-7C:IV, the high level alarms for the acid and caustic day tank were displayed on the condensate polisher system computer. These alarms were not noted by the ACO since they were mixed with other messages that were expected due to the operating evolutions in progress. At 1700 PDT, the action statement for TS 3.7.10, requiring an hourly fire watch for fire barrier impairments, was performed.

Shortly after the day tank high level alarms were initiated, the tanks began to overflow into a common overflow line and berm area. The mixing of the two chemicals produced an exothermic reaction yielding water, heat (steam), salt byproduct, unreacted caustic, and unreacted acid. The mixture discharged from the common overflow line in all directions of the bermed area. The steam and chemical mixture formed



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a dense mist that began to enter the 85-ft elevation of the polisher area, and the 104-ft elevation of the buttress area, including the hallway outside of the TSC. The mist also entered the north end of the Unit 2 turbine building through the screen roll-up door directly east of the acid and caustic bermed area.

On June 20, 1992, at 1718 PDT, a chemistry technician noticed the chemical cloud and notified the control room. The control room sounded the site fire alarm (IC)(FRA) and notified the condensate polisher ACO. The condensate polisher ACO recognized the problem and immediately isolated the tank transfer.

On June 20, 1992, between 1725 PDT and 1730 PDT, the fire brigade assembled on the turbine building 140-ft elevation, and the Shift Supervisor directed that a public address (PA) announcement be made to evacuate the turbine building as a precautionary measure and requested assistance from the California Department of Forestry (CDF). An Unusual Event was declared.

On June 20, 1992, at 1800 PDT, the fire watch surveillance required by TS 3.7.10 was missed when the required hourly fire watch was not performed. At 1815 PDT, fire brigade members installed ventilation fans to exhaust the fumes from the condensate polisher area, preventing further transit of the fumes to the turbine building. It was noted that turbine building conditions rapidly improved at this time. At 1821 PDT, the control room ordered the ventilation shifted from Mode 1 (normal operation) to Mode 4 (pressurization mode). At 1830 PDT, a CDF team arrived at the site and assessed the situation. They recommended that the general spill area be classified as a type A hazardous waste area, and that access be blocked to the area until appropriate protective clothing could be delivered from offsite. At 2046 PDT, the portable ventilation fans, which are gasoline powered, ran out of fuel, and could not be re-fueled and re-started since they were in the hazardous spill area. With the ventilation fans not running, the fumes from the spill area again began to affect the Unit 2 turbine building. A second evacuation notice was made on the PA system.

On June 20 and 21, 1992, between 2315 PDT and 0100 PDT, a Hazardous Materials Team assembled, gross cleanup was started, air samples were taken of all turbine building areas, and the samples indicated that access restrictions were not necessary. Free access was restored to all areas of the plant except the immediate spill area.

On June 21, 1992, at 0210 PDT, the hourly fire watch surveillance required by TS 3.7.10 was performed satisfactorily and the Unusual Event was terminated.



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

None.

E. Dates and Approximate Times for Major Occurrences:

1. June 20, at 1700 PDT: TS 3.7.10 requiring hourly fire watch was last performed.
2. June 20, at 1718 PDT: Chemistry technician discovered spill and reported it to the control room.
3. June 20, at 1722 PDT: ACO terminated spill.
4. June 20, at 1735 PDT: Unusual Event (UE) was declared. Initial notifications were made.
5. June 20, at 1800 PDT: TS 3.7.10 action statement was not met when fire watch was not performed.
6. June 20, at 1821 PDT: CRV was manually shifted to Mode 4.
7. June 21, at 0210 PDT: UE was terminated. Hourly fire watch in accordance with TS 3.7.10 action statement was resumed.

F. Other Systems or Secondary Functions Affected:

None.

G. Method of Discovery:

A chemistry technician discovered the spill and reported the situation to the control room. At approximately the same time, a mechanic noticed a smokelike cloud in the U-2 85-ft elevation of the turbine building. He reported it to his foreman and the Shift Supervisor.

H. Operators Actions:

1. The onsite fire brigade was assembled.
2. The acid and caustic day tank transfer was secured.
3. The control room and TSC ventilation systems were placed in Mode 4 (pressurization mode).



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I. Safety System Responses:

Upon manual actuation, the CRV system ventilation shifted to the pressurization mode.

III. Cause of the Event

A. Immediate Cause:

The immediate cause of the event was that the acid and caustic day tanks were simultaneously filled and both tanks overflowed. The overflow lines from the day tanks join into a common overflow line near the caustic tank and empty just above the floor into the northwest side of the day tank berm area.

Since these lines overflow into the same area and the caustic tank had been overflowing for some time, the end of the common overflow line became submerged. When the acid tank began to overflow, the mixture of the highly concentrated acid and caustic produced a steam and acid mist.

B. Root Cause:

The root cause of the event was personnel error. In order to save time, the non-licensed operator consciously decided to fill the acid and caustic day tanks simultaneously although the Operating Procedure cautions that only one day tank be filled at a time.

C. Contributory Cause:

1. The overflow lines for the acid and caustic tanks are piped together. There is also a common berm area that surrounds the caustic and acid day tanks and associated pumps.
2. Although both tanks have high level alarms that initiated, they did not prompt the ACO to take corrective actions. The alarms are inadequately designed because they do not emit audible signals and they are displayed only on a CRT along with other messages.

IV. Analysis of the Event

Plant fire barriers are designed to prevent fire in one fire area from spreading to adjacent areas containing safety-related equipment necessary to maintain the plant in a safe condition. TS 3.7.10 required that all fire barriers that protect safety-related equipment be operable. If a fire barrier required by TS 3.7.10 is inoperable or impaired, the TS requires, in



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part, that detection equipment be verified operable and that an hourly fire watch patrol be established.

The hourly fire watch was not performed for approximately 8 hours. Had a fire occurred during the time when no hourly fire watch patrol was performed, the fire would have been identified to control room personnel by plant fire detection equipment (IC).

Fire brigade fire suppression equipment (KP) was readily available in areas adjacent to the chemical spill. The fire suppression equipment available included: a fire engine (KP)(ENG), self-contained breathing apparatuses, exhaust fans, hazardous materials response kits, portable breathing compressor, local fire extinguishers (KQ), and offsite fire fighting personnel.

The CRV system was conservatively manually shifted from the normal ventilation mode to the pressurization mode per the control room directive. The chemical mist did not pose a threat to the public because most of the entire mass of spilled acid reacted with the excess of caustic in the berm and the mist remained inside the facility. A multi-disciplined team has determined that no safety-related equipment in the spill area or adjacent areas was affected.

Since a fire would have been detected and extinguished during the 8 hours the 1-hour fire patrol was not present, the operability of equipment was not jeopardized, and the health and safety of the public were not affected by this event.

V. Corrective Actions

A. Immediate Corrective Actions:

1. The ACO closed the storage tank fill lines to the caustic and acid day tanks. As a precautionary measure, the ACO de-energized the acid and caustic pumps by opening their supply breakers (EC)(BKR) and then secured the resin regeneration in progress.
2. As an additional precautionary measure, the turbine building was evacuated and the air was sampled. Access was then reinstated and the hourly fire watches were resumed.

B. Corrective Actions to Prevent Recurrence:

1. The ACO was counseled concerning his failure to perform his duties with adequate attention to detail.



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2. An Operations Incident Summary will be prepared for this event and reviewed with Operations personnel.
3. Design changes will be implemented on the condensate demineralizer regeneration system to provide a separate audible annunciator system (KD)(ANN).
4. A design change will be initiated to separate the overflow piping on the acid and caustic day tanks.

VI. Additional Information

- A. Failed Components:
None.
- B. Previous LERs on Similar Problems:
None.

