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SUBJECT: LER 91-016-00:on 910611,conditional required by TS 4.6.1.3.a missed.Caused by persoonel error.Operations training lesson guide revised & appropriate plant procedures revised.W/ 191028 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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James D. Shiffer
Senior Vice President and
General Manager
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October 28, 1991

PG&E Letter No. DCL-91-257

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

Re: Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Licensee Event Report 1-91-016-00
Missed Surveillance of Airlock Door Seals Due to Personnel Error
Caused by Inadequate Knowledge of Leak-Rate Monitor Operation

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(i)(B), PG&E is submitting the enclosed Licensee Event Report (LER) concerning a missed conditional surveillance of the Unit 1 containment personnel airlock door seals. This surveillance is required by Technical Specification 4.6.1.3.a.

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

Sincerely,

James D. Shiffer

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

NCR DC1-91-OP-N082

Enclosure

5530S/85K/JHA/2242



IE22
1/1

# 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 8 |

TITLE (4) MISSED SURVEILLANCE OF AIRLOCK DOOR SEALS DUE TO PERSONNEL ERROR CAUSED BY INADEQUATE KNOWLEDGE OF LEAK-RATE MONITOR OPERATION

| 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 | 27 | 91 | 91 | - 0 1 6 - | 0 0 | 10 | 28 | 91 | | 0 5 0 0 0 |
| | | | | | | | | | | 0 5 0 0 0 |

| OPERATING MODE (9) | 1 |
|---|---|
| POWER LEVEL (10) | 1 0 0 |

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

X 10 CFR 50.73(a)(2)(i)(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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | B D | F S V | V 1 3 7 | NO | | | | | | | |
| | | | | | | | | | | | |

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

ABSTRACT (16)


On June 11, 1991, at 0947 PDT, the conditional surveillance required by Technical Specification (TS) 4.6.1.3.a was missed when a leak rate test of the containment personnel airlock door was not satisfactorily performed following opening of the inner and outer doors.

On September 26, 1991, the operator performing daily surveillance checks noted that the personnel airlock leak-rate monitor was out-of-service because of a clearance for calibration. When the surveillance test was reviewed by plant engineering on September 27, 1991, the out-of-service status of the leak-rate monitor was noted and reported to the system engineer, who inquired as to the operability status of the leak-rate monitor. The shift supervisor at that time determined that the leak-rate monitor was inoperable, after which the door seals were successfully leak-rate tested. A review determined that an acceptable leak rate test was not performed following 17 containment entries during the period from June 11, 1991, to September 27, 1991.

The immediate cause of the missed surveillances was a faulty solenoid valve that rendered the leak-rate monitor incapable of performing automatically. The root cause is due to personnel error caused by inadequate knowledge of the leak-rate monitor operation. To prevent recurrence, an Operations Incident Summary has been prepared, a standard clearance has been created for the leak-rate monitor, the operations training lesson guide has been revised, and appropriate plant procedures will be revised.

I. Plant Conditions

Unit 1 was in Mode 1 (Power Operation) at 100 percent power.

II. Description of Event

A. Summary:

On June 11, 1991, at 0947 PDT, the conditional surveillance required by Technical Specification (TS) 4.6.1.3.a was missed when a leak-rate test of the containment personnel airlock door seals (BD)(AL)(DR)(SEAL) was not satisfactorily performed following opening of the inner and outer doors.

Technical Specification and Procedural Requirements:

TS 4.6.1.3.a requires that the containment airlock be demonstrated operable after each opening by verifying the seal leakage is acceptable. An automatic leak-rate monitor (BD)(MO) activates a test cycle after each opening and closing of the airlock doors. Each of the two personnel airlock doors is equipped with a pair of O-ring seals as the sealing surface when the doors are closed. The leak-rate monitor is designed to pressurize the volume between the two O-ring seals on one airlock door at a time and to monitor the flow of instrument air required to maintain the seal volume.

The leak-rate monitor alarms in the control room if the seal leakage exceeds the leak-rate monitor alarm setpoint or if the space between the seals cannot be pressurized. Annunciator Response Procedure (AR) PK11-12, "Containment Airlock Hi Leakage," required that the operator (a) determine if the alarm was valid (b) determine if leakage exceeds the TS limit for the present mode, (c) perform Surveillance Test Procedure (STP) M-8F, "Leak Rate Testing of Personnel Air Lock Seals," if necessary, and (d) conform to the TS 3.6.1.2 Action Statement.

STP I-1B, "Routine Daily Checks," requires Operations to verify on a daily basis that the leak-rate monitor is energized and in the automatic mode. If the leak-rate monitor is energized and in the manual mode, then STP I-1B requires that Operations verify that STP M-8F has been performed and is current if containment entries have been made.

Chronology:

On June 5, 1991, Operations identified a problem with the leak-rate monitor. Indicated flow was initially erratic and higher than permitted by TS, but by performing the manual test several times, the flow readings decreased and provided a valid, acceptable flow rate. Because the leak-rate monitor only attempts a single cycle during the

automatic leak-rate test, a high flow reading was obtained and a leak-rate test failure alarm was received in the control room. Subsequent manual testing provided a valid leak-rate test, indicating to the operator that the door seals were operable. Operations assumed that subsequent operating shifts would perform a manual leak-rate test following receipt of an automatic leak-rate test failure alarm. For this reason, the leak-rate monitor was not declared inoperable at this time even though its performance was known to be degraded.

On September 20, 1990, a clearance was issued to take the leak-rate monitor out-of-service for calibration. This clearance closed the air supply valves to the door seals and rendered the system inoperable for either manual or automatic testing. The clearance did not, however, identify that the leak-rate monitor was required to meet TS surveillance requirements. Because the leak-rate monitor was still energized and in automatic, it appeared that a leak-rate test could be performed. However, when a test was automatically run, the air pressure was applied to the closed valves rather than to the door seals. The problem with the artificially high indicated flow caused a leak-rate test failure alarm to be received in the control room under these conditions.

During the night shift of September 25-26, 1991, an unlicensed plant operator performed STP I-1B and identified that the leak-rate monitor was out-of-service because of the clearance that had been issued on September 20. The engineer who reviewed the completed STP I-1B on September 27, 1991, noted that the leak-rate monitor was inoperable and told the system engineer responsible for the personnel airlock, who in turn inquired about the operability status of the leak-rate monitor at the plant daily planning meeting. The on-shift operations shift supervisor, who attends the daily meetings, investigated the status of the leak-rate monitor and determined that it was inoperable. The leak-rate test surveillance required by TS 4.6.1.3.a was performed satisfactorily on September 27, 1991, at 1528 PDT.

On October 4, 1991, a solenoid-operated vent valve (BD)(FSV) was identified as the source of electrical noise that caused artificially high flow indications in the leak-rate monitor during leak-rate testing. It was determined that the solenoid was also the cause of the high flow indications and leak-rate test failure alarms that were identified on June 5, 1991.

As indicated by radiation protection records, there were 23 entries into containment (NH) during the period from June 5, 1991, to September 27, 1991. Following 6 of these entries, the personnel airlock door seals were manually leak-rate tested in accordance with STP M-8F to meet the requirements of TS 4.6.1.3.a. Following 17 of these entries, the operators reset the alarm and assumed that because there were no further alarms, the monitor satisfactorily confirmed an

acceptable leak rate. Therefore, the personnel airlock door seals were not satisfactorily tested in accordance with TS 4.6.1.3.a following opening of the inner and outer doors. The first such containment entry occurred on June 11, 1991, at 0947 PDT.

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

A faulty solenoid-operated vent valve rendered the leak-rate monitor incapable of performing its automatic function.

C. Dates and Approximate Times for Major Occurrences:

1. June 5, 1991: The problem with automatic leak-rate testing of the personnel airlock door seals was documented.

2. June 11, 1991, 0947 PDT: Event Date: First surveillance was missed when neither an automatic nor a manual leak-rate test was performed on the personnel airlock door.

3. September 27, 1991, 0830 PDT: Discovery Date: Leak-rate monitor declared inoperable after the systems engineer inquired about its status at the plant daily planning meeting.

4. September 27, 1991, 1528 PDT: The personnel airlock door seals were successfully leak-rate tested in accordance with STP M-8F.

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

Plant operators performing STP I-1B identified that the leak-rate monitor was out-of-service for calibration. The systems engineer for the leak-rate monitor inquired about its status, and the on-shift operations shift supervisor determined that the leak-rate monitor had been inoperable since September 20, 1991, when the clearance was issued for its calibration. Further investigation determined that the leak-rate monitor had been inoperable since June 5, 1991, when in the automatic mode.

F. Operators Actions:

The personnel airlock door seals were leak-rate tested on September 27, 1991, in accordance with STP M-8F, and a conditional surveillance tracking sheet was implemented in accordance with Administrative Procedure (AP) C-6S4, "Control of Equipment Required by the Technical Specifications."

G. Safety System Responses:

None.

III. Cause of the Event

A. Immediate Cause:

The immediate cause of the missed surveillances on the personnel airlock door seals following containment entry was a faulty solenoid valve that rendered the leak-rate monitor incapable of performing its automatic function. This valve is a solenoid-operated vent valve which is used to keep the flow transducer vented until a test is required. The solenoid induced electrical noise into the flow transducer, which resulted in an artificially high indicated flow rate. This indicated high flow rate, in turn, caused a leak-rate test failure alarm in the control room. The majority of plant operators did not recognize that the leak-rate monitor was unable to perform its automatic function, and they reset the failure alarms without proper investigation or manual retesting following the majority of the door entries.

B. Root Causes:

The root cause of this event was personnel error caused by inadequate knowledge concerning the operation of the containment personnel hatch leak-rate monitor. When queried, the majority of the operators thought that resetting the leak-rate monitor at the local panel would cause the monitor to repeat the door seal test. If personnel had understood that following a leak-rate test failure alarm it was mandatory to perform a manual leak-rate test, no surveillances would have been missed.

C. Contributory Causes:

1. The clearance for the I&C calibration of the leak-rate monitor was inadequate to alert personnel that the leak-rate monitor was inoperable when the automatic leak-rate tests were performed. The clearance placed an "out-of-service" sticker on the leak-rate monitor panel next to the flowmeter; however, the sticker was not adequate to flag the entire system as being inoperable,

and it did not state exactly what component or system was out of service. The operators who were performing STP I-1B and the operators who reset the monitor following an automatic leak-rate test failure alarm assumed that the sticker applied to the flowmeter.

2. Procedure AR PK11-12 did not specifically require that a manual leak-rate test be performed if an automatic leak-rate test failure alarm was received.

3. The review process for problem identification and resolution was ineffective. The initial screening of the problem documented on June 5, 1991 failed to conclude that the leak-rate monitor was inoperable in the automatic mode and that a conditional surveillance was necessary. The system engineer responsible for the leak-rate monitor added comments to the problem documentation and offered to lend assistance in obtaining a solution. However, there appeared to be no follow up on this problem. Since the leak-rate monitor is not quality related, the problem did not require a review by quality control (QC).

4. The Shift Foreman who authorized removal of the leak-rate monitor from service for calibration did not perform an adequate review of the clearance.

5. STP I-1B checked only that the leak-rate monitor was energized and the automatic mode selected. It neither required a determination of operability nor provided instructions for performing conditional surveillances if the monitor was inoperable.

6. Although the leak-rate monitor was relied upon to perform a surveillance test on the personnel hatch door seals automatically following each door operation, it was not tested periodically to ensure that it performed its function satisfactorily.

IV. Analysis of the Event

The containment personnel airlock door seals are required to maintain the pressure integrity of the containment building. During the period of June 5, 1991, to September 27, 1991, when the personnel airlock doors seals were successfully tested, surveillances demonstrated that the door seals were performing their function as required. Because these are static seals, they would not have degraded and would have passed each surveillance test. There are no indications that the personnel airlock door seals were not capable of performing their intended safety function during that period. Consequently, this event did not adversely affect the health and safety of the public.

V. Corrective Actions

A. Immediate Corrective Actions:

1. The Unit 1 leak-rate monitor was declared inoperable and a conditional surveillance tracking sheet was implemented.

2. The Unit 1 personnel airlock door seals were tested satisfactorily using STP M-8F on September 27, 1991.

3. The leak-rate monitor was repaired and returned to service.

4. Procedure AR PK11-12 was revised for each unit to require a manual leak-rate test per STP M-8F if a leak-rate test failure alarm is received in the control room.

5. On October 11, 1991, prior to Unit 2 entering Mode 4 (Hot Shutdown) from Mode 5 (Cold Shutdown), operation of the Unit 2 leak-rate monitor was checked in automatic. The leak-rate monitor worked properly and the door seals passed this automatic surveillance. There have been no past problems related to the Unit 2 personnel airlock leak-rate monitor.

B. Corrective Actions to Prevent Recurrence:

1. An Operations Incident Summary was prepared regarding the missed surveillance of the airlock hatch door seal. This summary stressed proper review of clearances and clarified the operating details of the leak-rate monitor.

2. STP I-1B will be revised to clarify requirements for determining operability of the leak-rate monitor and for related conditional surveillance requirements.

3. A standard clearance has been created for taking the leak-rate monitor out of service. This clearance includes instructions to clearly identify the leak-rate monitor as being inoperable and to implement the required conditional surveillance.

4. A review will be conducted of all plant equipment which is used to automatically satisfy a TS surveillance test. Following this review, AP C-55, "Balance-of-Plant Reliability Program," will be revised to ensure that future problems identified for this type of equipment will receive QC review.

5. Operations Training revised the appropriate lesson guide to include additional details on the leak-rate monitor and its operation.

6. I&C loop tests on the leak-rate monitor will be revised so that a functional test of the automatic leak-rate test is performed periodically.

VI. Additional Information

A. Failed Components:

Valve, Solenoid - Manufactured by Volumetrics, Part Number 49000008.

B. Previous LERs on Similar Problems:

None.