

## PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

P. O. BOX A

SANATOGA, PENNSYLVANIA 19464

(215) 327-1200 EXT. 2000

May 20, 1991

J. DOERING, JR.  
PLANT MANAGER  
LIMERICK GENERATING STATION

Docket Nos. 50-352  
50-353  
License Nos. NPF-39  
NPF-85

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

SUBJECT: Licensee Event Report  
Limerick Generating Station - Units 1 and 2

This LER reports the inadvertent isolation of the Refuel Floor Secondary Containment and the initiation of the 'B' train of the Standby Gas Treatment System, both Engineered Safety Features (ESF). Preliminary investigation indicates that the cause of this event is due to the generation of a false differential pressure signal as a result of a suspected small tubing or valve leak associated with the sensing line of a differential pressure transmitter.

Reference: Docket Nos. 50-352  
50-353  
Report Number: 1-91-010  
Revision Number: 00  
Event Date: April 18, 1991  
Report Date: May 20, 1991  
Facility: Limerick Generating Station  
P.O. Box A, Sanatoga, PA 19464

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Very truly yours,

WGS:rgs

cc: T. T. Martin, Administrator, Region I, USNRC  
T. J. Kenny, USNRC Senior Resident Inspector, LGS

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 3 5 2 1 OF 0 5

TITLE (4) This LER reports the inadvertant isolation of the Refuel Floor Secondary Containment & initiation of the 'B' Standby Gas Treatment system due to a suspected tubing or valve leak.

| EVENT DATE (5) |     |      | LER NUMBER (6) |                   |                 | REPORT DATE (7) |     |      | OTHER FACILITIES INVOLVED (8) |  |                  |
|----------------|-----|------|----------------|-------------------|-----------------|-----------------|-----|------|-------------------------------|--|------------------|
| MONTH          | DAY | YEAR | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH           | DAY | YEAR | FACILITY NAMES                |  | DOCKET NUMBER(S) |
| 0              | 4   | 18   | 91             | 010               | 00              | 05              | 20  | 91   | Unit 2                        |  | 0 5 0 0 0 3 5 3  |
|                |     |      |                |                   |                 |                 |     |      |                               |  | 0 5 0 0 0        |

OPERATING MODE (9) 1

POWER LEVEL (10) 0.30

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50. (Check one or more of the following) (11)

|                   |                 |   |                     |  |
|-------------------|-----------------|---|---------------------|--|
| 20.402(b)         | 20.405(c)       | X | 50.73(a)(2)(iv)     | 73.71(b)   |
| 20.405(a)(1)(iii) | 50.36(a)(1)     |   | 50.73(a)(2)(v)      | 73.71(c)   |
| 20.405(a)(1)(iv)  | 50.36(a)(2)     |   | 50.73(b)(2)(v)      | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| 20.406(a)(1)(iv)  | 50.73(a)(2)(i)  |   | 50.73(a)(2)(iii)(A) |  |
| 20.405(a)(1)(iv)  | 50.73(a)(2)(ii) |   | 50.73(a)(2)(iii)(B) |  |
| 20.406(a)(1)(iv)  | 50.73(a)(2)(iv) |   | 50.73(a)(2)(v)      |  |

LICENSEE CONTACT FOR THIS LER (12)

NAME: G. J. Madsen, Regulatory Engineer, Limerick Generating Station

TELEPHONE NUMBER: 215 327-1200

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NFRDS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NFRDS |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
|       |        |           |              |                     |       |        |           |              |                     |
|       |        |           |              |                     |       |        |           |              |                     |

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15) 06 18 91

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On April 18, 1991, during surveillance testing, an isolation of the Refuel Floor Secondary Containment (RFSC) occurred, an Engineered Safety Feature (ESF) actuation. This was due to a low negative differential pressure signal being (i.e., a negative differential pressure approaching zero) between the RFSC and the outside environment. The 'B' train of the Standby Gas Treatment System also started, an ESF actuation. There were no adverse consequences and no radioactive material was released to the environment as a result of this event. The RFSC was not required since there were no core alterations, movement of irradiated fuel, or operations with a potential for draining the reactor vessel prior to, or during this event. The cause of this event was the generation of a false differential pressure signal resulting from a suspected small leak in the outside air sensing line or manifold equalizing valve for a Refuel Floor differential pressure transmitter. Instrumentation and Control personnel performed a leak check of tubing and valves and reperformed Procedure ST-2-076-401-1 while the output of the differential pressure transmitter was observed for a degrading differential pressure condition. However, further investigation is required to confirm the cause of this event and identify any leaking fittings. A supplement will be provided to clearly define causes and present any additional corrective actions.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

| FACILITY NAME (1)                   | DOCKET NUMBER (2)             | LER NUMBER (5) |                   |                 | PAGE (3) |    |       |
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|                                     |                               | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          | OF |       |
| Limerick Generating Station, Unit 1 | 0   5   0   0   0   3   5   2 | 9   1          | —   0   1   0     | —   0   0       | 0   2    | OF | 0   5 |

TEXT (if more space is required, use additional NRC Form 368A's) (17)

Unit Conditions Prior to the Event:

Unit 1 Operational Condition was 1 (Power Operation) at 30% Power Level.

Unit 2 Operational Condition was 5 (Refueling, Offloaded) at 0% Power Level.

Refuel Floor Secondary Containment (RFSC, EIIS:JM) negative differential pressure was not required since no core alterations, movement of irradiated fuel, or activities with the potential for draining the Unit 2 reactor vessel were planned or being performed. The Refuel Floor (RF) normal Heating, Ventilation and Air Conditioning (HVAC) system was inservice. The 'B' train of the Standby Gas Treatment System (SGTS, EIIS:BH) and associated isolation logic was inoperable for the purpose of performing a surveillance test.

There were no other structures, systems, or components out of service which contributed to this event.

Description of the Event:

On April 18, 1991, at 1019 hours, while Instrumentation & Control (I&C) personnel were performing the Unit 1 Surveillance Test (ST) procedure ST-2-076-401-1, "NSSSS - Outside Atmosphere to Reactor Enclosure Differential Pressure - Low; Channel B Calibration Test (PDT-76-498B, PDSHL-76-198B)," an isolation of the common RFSC occurred, an Engineered Safety Feature (ESF) actuation. This was due to Pressure Differential Transmitter PDT-076-399B indicating a false low negative differential pressure condition as a result of a suspected small tubing or valve leak. The common 'B' train of the SGTS initiated due to the isolation signal. This is also an ESF actuation that resulted in maintaining RFSC at the required negative differential pressure. Main Control Room (MCR) licensed operations personnel immediately received alarms associated with the RFSC isolation and the initiation of the 'B' train of the SGTS.

Sixteen seconds after initiation of the RFSC isolation, the 'B' train of the SGTS tripped due to a low flow condition. This low flow condition resulted from the false differential pressure signal associated with PDT-076-399B. This false differential pressure signal caused the 'B' SGTS pressure controller to run the 'B' SGTS fan until the actual RFSC differential pressure was drawn excessively negative. The offset between the actual and the sensed differential pressures resulted in the inability of the SGTS control dampers to stabilize flow above the SGTS fan low flow trip setpoint. At 1027 hours, MCR licensed operations personnel reset the isolation. Additionally, after realignment of logic switches to preclude the generation of an isolation signal, procedure ST-2-076-401-1 was reperformed and completed satisfactorily. The RFSC was then manually isolated by licensed MCR operations personnel and the 'B' SGTS was initiated and run for one hour to verify that the differential pressure condition no longer existed and ensure RFSC and SGTS operability.

| FACILITY NAME (1)                   | DOCKET NUMBER (2)             | LER NUMBER (6) |                   |                 | PAGE (3) |          |
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|                                     |                               | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |          |
| Limerick Generating Station, Unit 1 | 0   5   0   0   0   3   5   2 | 9   1          | -   0   1   0     | -   0   0       | 0   3    | OF 0   5 |

TEXT (If more space is required, use additional NRC Form 366A's) (7)

A four hour notification to the NRC was made on April 18, 1991, at 1406 hours, in accordance with the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in the automatic actuation of ESFs. This report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

#### Analysis of the Event:

There were no actual adverse consequences and no radioactive material was released to the environment as a result of this event. The RFSC was not required, since there were no core alterations, movement of irradiated fuel, or operations with a potential for draining the reactor vessel prior to, or during this event. The RFSC isolation and 'B' train of the SGTS initiated as designed on the low negative differential pressure signal. Actual RFSC negative differential pressure increased from a -0.29 inches water gauge (wg) to more than a -0.35 inches wg. Therefore, the potential for any unfiltered radioactive release to the environment was not increased.

In the event that an actual condition existed requiring the isolation of the RFSC and initiation of SGTS, the 'A' train instrumentation for both the RF Area differential pressure and Reactor Enclosure differential pressure was operable. Therefore, with the RFSC isolated, the redundant 'A' SGTS would have been capable of initiating and performing its intended safety function and maintain RFSC negative differential pressure.

#### Cause of the Event:

The cause of this event was the generation of a false low negative differential pressure signal as a result of a suspected small leak in the isolated outside air sensing line, or the manifold equalizing valve for PDT-076-399B allowing indicated negative differential pressure to approach zero.

Since the 'B' outside air sensing line header was isolated in accordance with ST-2-076-401-1 (see Figure 1), a small leak in the instrument tube fittings could, over time, allow the 'B' outside air sensing line header pressure to vent and equalize such that the differential pressure across the transmitter approached zero. This is due to PDT-076-399B being physically located in the Unit 1 Reactor Enclosure. Therefore, the negative differential pressure decayed and reached -0.1 inches wg causing the 'B' isolation signal to be generated. The same scenario would occur if the manifold equalizing valve for PDT-076-399B had a small leak.

A computer time history plot provides evidence that the 'B' RFSC differential pressure signal was slowly approaching zero prior to the event while the 'A' RFSC differential pressure signal indicated a constant differential pressure. Further evidence of a possible small tubing leak is that the differential pressure as sensed by PDT-076-399B approached -0.35 inches wg upon the starting of the 'B' SGTS fan. After the fan tripped, the channel 'B' instrumentation indicated that negative differential pressure for the RFSC began to decay again



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|  |   |                |                   |                 |          |          |
|--|---|----------------|-------------------|-----------------|----------|----------|
| FACILITY NAME (1)<br><br>Limerick Generating Station, Unit 1 | DOCKET NUMBER (2)<br><br>0 15   0   0   0   3   5   2 | LER NUMBER (6) |                   |                 | PAGE (3) |          |
|  |   | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |          |
|  |   | 9   1          | —   0   1   0     | —   0   0       | 0   4    | OF 0   5 |

TEXT (If more space is required, use additional NRC Form 306A's) (17)

and then returned immediately to -0.35 inches wg once the sensing line header was returned to service. With this outside air sensing line header in service, the volume of air available is infinite and a small leak becomes insignificant as to the ability of PDT-076-399B to sense actual negative differential pressure.

Corrective Actions:

As a result of plant conditions, a leak check of tubing and valves could not be initially performed by I&C personnel. However, on May 16, 1991, I&C personnel were able to perform a leak check of tubing and valves and then performed procedure ST-2-076-401-1 while observing the output of PDT-076-399B for a slowly degrading differential pressure condition. No leaks were identified and the pressure transient could not be reproduced. Further investigation is required to confirm the cause of this event and to identify and repair any leaking fittings. Upon completion of this investigation a supplement will be provided to clearly define causes and present any additional corrective actions as necessary.

Previous Similar Occurrences:

LERs 1-88-025, 1-89-010 and 1-89-043 also resulted in RF isolations and SGTS actuations. These LERs were the result of a equipment deficiency, a personnel error, a procedure deficiency, or a design deficiency and not a small tubing or valve leak. Therefore, due to dissimilar causes the corrective actions for the above listed LERs could not have prevented this event from occurring.

Tracking Codes: (899) - Other Deficiency

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)

DOCKET NUMBER (2)

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PAGE (3)

Limerick Generating Station, Unit 1

0 5 0 0 0 3 5 2

| YEAR | SEQUENTIAL NUMBER | REVISION NUMBER |
|------|-------------------|-----------------|
| 91   | 010               | 00              |

0 5 OF 0 5

TEXT (if more space is required, use additional NRC Form 366A (1/77))

Figure 1

