

LICENSEE EVENT REPORT (LER)

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

TITLE (4) Reactor Enclosure Secondary Containment Isolation on Low Differential Pressure Due to the 'A' and 'C' Exhaust Fan Blade Pitch Settings Requiring Adjustment. 1

EVENT DATE (5) MONTH DAY YEAR
0 1 0 3 8 8
LER NUMBER (8) YEAR SEQUENTIAL NUMBER REVISION NUMBER
8 8 - 0 0 2 - 0 1 0 3 1 4 8 8
REPORT DATE (7) MONTH DAY YEAR
0 1 0 3 1 4 8 8
OTHER FACILITIES INVOLVED (6) FACILITY NAMES DOCKET NUMBER(S)
0 5 0 0 0 0
0 5 0 0 0 0OPERATING MODE (9) 1
POWER LEVEL (10) 1 0 10
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)
20.402(b) 20.405(a) ☒ 80.73(a)(2)(iv) 73.71(b)
20.405(a)(1)(i) 80.36(a)(1) 80.73(a)(2)(v) 73.71(a)
20.405(a)(1)(ii) 80.36(a)(2) 80.73(a)(2)(vi) OTHER (Specify in Abstract below and in Text, NRC Form 306A)
20.405(a)(1)(iii) 80.73(a)(2)(i) 80.73(a)(2)(vii)(A)
20.405(a)(1)(iv) 80.73(a)(2)(ii) 80.73(a)(2)(vii)(B)
20.405(a)(1)(v) 80.73(a)(2)(iii) 80.73(a)(2)(ix)LICENSEE CONTACT FOR THIS LER (12) NAME TELEPHONE NUMBER
Charles A. Mengers, Senior Engineer, Licensing Section
AREA CODE 2 1 5 8 4 1 - 5 1 8 4COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPDOS
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPDOSSUPPLEMENTAL REPORT EXPECTED (14) YES (If yes, complete EXPECTED SUBMISSION DATE) NO
EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

Abstract:

On January 30, 1988 at 0901 hours an isolation of the Reactor Enclosure Secondary Containment occurred and the Standby Gas Treatment System (SGTS) and the Reactor Enclosure Recirculation System (RERS), Engineered Safety Features, initiated as designed. Nuclear Steam Supply Shutdown System (NSSSS) Group VI A and B isolation signals were also received. Prior to the isolation, the 'B' and 'C' exhaust fans had been in service; however, a decrease in air pressure (later found during troubleshooting to be due to a hole in the instrument air tubing) to the 'B' exhaust fan damper actuator resulted in tripping the 'B' fan, and the 'A' exhaust fan automatically started as designed. The isolation occurred when the 'A' and 'C' exhaust fan combination was unable to maintain Reactor Enclosure Secondary Containment to outside atmosphere differential pressure greater than the negative 0.1 inch water gauge setpoint. The isolation was reset at 1025 hours and differential pressure was maintained, following restart of Reactor Enclosure HVAC, with the 'A' and 'C' exhaust fans operating with a restricted inlet air flow. The failed tubing was replaced and the 'B' exhaust fan was returned to operation at 1457 hours. The Reactor Enclosure supply and exhaust fans' blade tip angles were checked and adjusted as necessary. Additional clamps have been installed to limit the tubing vibration which resulted in the unusual tubing wear. There were no adverse consequences and no release of radioactive material as a result of this event.

SEP 2 1988

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Limerick Generating Station Unit 1	05000352	88	002	01	02	OF	05

TEXT (if more space is required, use additional NRC Form 365A's) (17)

Unit Conditions Prior to the Event:

Operating Mode 1 (Power Operation)

Reactor Power - 100%

Description of the Event:

On January 30, 1988 at 0901 hours, the Reactor Enclosure Secondary Containment isolated and the Standby Gas Treatment System (SGTS) and the Reactor Enclosure Recirculation System (RERS), Engineered Safety Features, initiated as designed. Nuclear Steam Supply Shutdown (NSSSS) Group VI A and B isolation signals (Primary Containment Purge, Supply and Exhaust) were received; however, the valves affected by these signals are normally closed and remained closed as designed. The isolation occurred when the differential pressure between the Reactor Enclosure Secondary Containment and the outside atmosphere decreased below the negative 0.1 inch water gauge setpoint for the 100 second time delay.

Prior to the isolation, the 'B' and 'C' exhaust fans had been in service; however, at 0900 hours the 'B' exhaust fan tripped and the 'A' Reactor Enclosure exhaust fan automatically started as designed. The combination of the 'A' and 'C' exhaust fans was unable to maintain Reactor Enclosure to outside atmosphere differential pressure greater than the negative 0.1 inch water gauge setpoint. Isolation occurred when the differential pressure remained less than negative 0.1 inch water gauge setpoint for the designed 100 second time delay. The inability of the 'A' and 'C' exhaust fan combination to maintain differential pressure resulted from the fan blade pitch settings requiring adjustment, a condition that had previously been identified in Licensing Event Report (LER) 87-062 on November 14, 1987.

At 1025 hours the isolation was reset, and operations personnel closed three face dampers (TDC-076-104-4, TDC-076-104-5, TDC-076-104-6) and bypass damper (TDC-076-104-1), located upstream of the Reactor Enclosure supply fans, in accordance with troubleshooting instructions, to restrict Reactor Enclosure inlet air flow. Reactor Enclosure Ventilation was returned to normal operation with the 'A' and 'C' exhaust fans in service. The 'A' and 'C' exhaust fans were able to maintain differential pressure with the restricted inlet air flow. The Reactor Enclosure Secondary Containment Ventilation remained isolated for 1 hour 24 minutes.

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APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

Consequences of the Event:

There was no release of radioactive material as a result of this event. There were no adverse consequences associated with this event. The Reactor Enclosure isolated as designed on low differential pressure and SGTS and RERS initiated as designed.

Cause of the Event:

Operators had identified the inability of the 'A' and 'C' Reactor Enclosure exhaust fan combination to maintain Reactor Enclosure to outside atmosphere differential pressure on November 14, 1987. Maintenance Requests to inspect and adjust as necessary the fan blade pitch settings had been issued; however, this work had not been scheduled. Operation with the 'A' and 'B', and the 'B' and 'C' combinations had been verified. Following the isolation, at 1235 hours, a planned Reactor Enclosure isolation was initiated to troubleshoot the 'B' exhaust fan damper. While troubleshooting, it was discovered that the instrument air tubing to the 'B' exhaust fan damper had worn through due to mechanical wear caused by the tubing rubbing against its support. This caused instrument air pressure to the 'B' fan damper to decrease. The lower air pressure was unable to maintain the damper in the open position and the damper subsequently closed. Closure of the 'B' fan damper automatically tripped the 'B' fan. The 'A' exhaust fan automatically started on the 'B' exhaust fan trip signal; however, the 'A' and 'C' exhaust fan combination was unable to maintain differential pressure greater than the negative 0.1 inch water gauge setpoint as stated previously. During an inspection of the instrument air tubing to the Reactor Enclosure fans to determine the reason for the tubing failure, test engineers discovered that tubing of different sizes had been placed under the same clamp during initial installation. The clamp was not designed to hold tubing of different sizes and the clamp did not hold the tubing tight enough, allowing it to vibrate against its support. This resulted in the abnormal tubing wear, and subsequent failure.

Corrective Actions:

The instrument air tubing to the 'B' exhaust fan damper was replaced and the 'B' exhaust fan damper stroke tested. Face dampers TDC-076-104-4, TDC-076-104-5 and TDC-076-104-6, and bypass damper TDC-076-104-1 were returned to their normal

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U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

operating status and the planned Reactor Enclosure isolation was reset at 1457 hour. Reactor Enclosure HVAC was restarted. The 'B' exhaust fan was returned to operation, the 'A' exhaust fan placed in standby, and Reactor Enclosure to outside atmosphere differential pressure was maintained by the Reactor Enclosure 'B' and 'C' exhaust fan.

Actions Taken to Prevent Recurrence:

On February 10, 1987 the instrument air supply tubing to the Reactor Enclosure supply and exhaust fans was inspected for abnormal wear. No other leaks or abnormal tubing wear were found.

Additional clamps have been installed in the area where the abnormal tube wearing was experienced. Engineering is performing walkdowns and evaluating a modification to install additional clamps to the instrument air tubing associated with the Reactor Enclosure Ventilation fans, Refuel Floor Ventilation fans and Turbine Enclosure Ventilation fans to prevent tubing vibrations. Work under this modification will commence after walkdowns and is expected to be completed by the end of the next Refueling Outage, which is scheduled for January, 1989.

On February 10 and 12, the fan tip angles of the 'A', 'B' and 'C' Reactor Enclosure supply and exhaust fans were inspected and adjusted as necessary.

EIIS Codes:

VB - Reactor Enclosure Ventilation

JM - NSSSS

AD - RERS

BH - SGTS

FAN - Supply and Exhaust Fans

CDMP - Face dampers, Positioners

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Previous Similar Occurrences:

Limerick LER 87-050 reported a Reactor Enclosure Secondary Containment isolation due to abnormal wear of the air supply tubing to the 'B' Reactor Enclosure exhaust fan. Limerick LER 87-062 reported a Reactor Enclosure Secondary Containment isolation which occurred when the 'A' and 'C' exhaust fans failed to maintain differential pressure due to exhaust fan blade pitch settings being out of adjustment.

Tracking Codes: (B2) Equipment Failure due to Abnormal Wear
(B9) Construction/Installation Error

PHILADELPHIA ELECTRIC COMPANY

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(215) 841-4000

March 14, 1988

Docket No. 50-352

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Washington, DC 20555

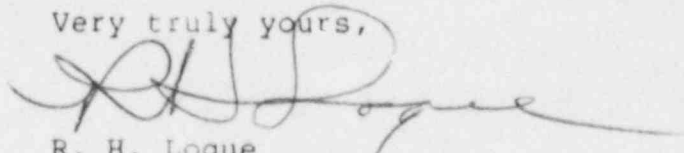
SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This revised LER concerns an isolation of the Reactor Enclosure Secondary Containment on low differential pressure due to the inability of the 'A' and 'C' Reactor Enclosure exhaust fans to maintain differential pressure as a result of the exhaust fan blade pitch settings requiring adjustment.

Reference:	Docket No. 50-352
Report Number:	88-002
Revision Number:	01
Event Date:	January 30, 1988
Report Date:	March 14, 1988
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This revised LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv) to clarify the sequence of events that occurred in determining the cause of the Reactor Enclosure Secondary Containment isolation. The changes are indicated by a vertical bar located in the right margin.

Very truly yours,



R. H. Logue
Assistant to the Manager
Nuclear Support Division

cc: W. T. Russell, Administrator, Region I, USNRC
E. M. Kelly, Senior Resident Site Inspector

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