

LICENSEE EVENT REPORT (LER)

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

TITLE (4)  
 Various Engineered Safety Feature Actuations due to a Fuse Failure

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)
05	07	88	88	016	00	06	06	88				05000
												05000

OPERATING MODE (9) 1

POWER LEVEL (10) 090

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(e)
<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(e)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Charles A. Mengers, Senior Engineer, Licensing Section	215 841-5184

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
B	JIC	IFIU	B151719	NO					

SUPPLEMENTAL 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 May 7, 1988 at 0746 hours, a channel 'B' Reactor Protection System (RPS) 1/2 SCRAM and various Nuclear Steam Supply Shutoff System (NSSSS) isolations (Engineered Safety Features) occurred as the result of a blown 60 amp power supply fuse. An automatic start of the 'B' Standby Gas Treatment System (SGTS) also resulted from the loss of the 'B' channel initiation logic. Operators verified that all isolations and automatic actions occurred as designed. Reactor power was reduced to 80% from 90% in order to prevent damage to the recirculation pump motor seals which had lost cooling water as a result of the isolations. There was no release of radioactive material to the environment as a result of this event. The root cause of this event is believed to be overheating of the fuse resulting from inadequate contact between the fuse and the fuse spring clips. Fuse spring clip clamps have been installed to improve contact between the fuse and its spring clips. The blown fuse was replaced at 0803 hours and the 1/2 SCRAM was reset. At 0807 hours, all NSSSS isolations were reset and by 0822 all other systems which had isolated were restored to normal. The fuse spring clips for the 60 amp power supply fuse to the 'A' and 'B' channel RPS will be inspected and replaced if necessary during an outage of sufficient duration.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR 88	SEQUENTIAL NUMBER - 0   1   6	REVISION NUMBER - 0   0	0   2	OF 0   5

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

Unit Conditions Prior to the Event:

Operating Mode - 1 (Power Operation)  
 Reactor Power - 90%

Description of the Event:

On May 7, 1988 at 0746 hours a channel 'B' Reactor Protection System (RPS) 1/2 SCRAM and various Nuclear Steam Supply Shutoff System (NSSSS) isolations (Engineered Safety Features) occurred due to the failure of a 60 amp power supply fuse.

At 0746 hours, Control Room operators received a "'B' channel RPS out of service" annunciator and other annunciators associated with a loss of power to the 'B' channel RPS. This resulted in the following NSSSS isolations:

- Group IIA - Shutdown Cooling and Head Spray Lines
- Group IIB - RHR Heat Exchanger Sample Lines and RHR Drain to Radwaste
- Group IIC - RHR Heat Exchanger Vacuum Breaker Lines
- Group III - Reactor Water Cleanup Lines
- Group VIA - Primary Containment Purge Supply & Exhaust
- Group VIB - Primary Containment Exhaust to Equipment Compartment
- Group VIC - Primary Containment Sampling and Recombiner
- Group VIIA - Primary Containment Instrument Gas Lines
- Group VIIB - Primary Containment Instrument Gas TIP Purge Line
- Group VIIIA - Drywell Chilled Water Lines and Reactor Chilled Water to Recirculation Pump seals
- Group VIIIB - Miscellaneous Process Lines

Reactor Enclosure HVAC  
 Instrument Gas Block and Vent Valves

The 'B' train of the Standby Gas Treatment System (SGTS) autostarted as a result of the loss of the 'B' channel initiation logic.

The isolation logic for the following systems require a signal from two independent channels and therefore did not result in any valve movement:

- Group IA - MSIVs and Steam Drain Lines
- Group IB - Main Steam and Reactor Water Sample Lines

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		YEAR  8   8	SEQUENTIAL NUMBER  -   0   1   6	REVISION NUMBER  -   0   0	0   3	OF 0   5

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

Operators verified that the isolations functioned as designed. At 0758 hours reactor power was reduced to 80% from 90% by reducing recirculation pump speed in order to prevent damage to the recirculation pump seals. The blown fuse was identified and replaced. At 0803 hours, the 'B' channel 1/2 SCRAM was reset, followed by NSSSS isolation resets at 0807 hours and restoration of the Reactor Water Cleanup system (RWCU) at 0822. The elapsed time of this event was 36 minutes.

Consequences of the Event:

Drywell Chilled Water was lost to the Recirculation Pump Motor Air Coolers and Reactor Enclosure Chilled Water was lost to the Recirculation Pump Seal and Motor Oil Coolers. Had the normal plant operation continued without cooling to the pump motors and pump seals, damage to them could have occurred. Damage to the seals could have resulted in leakage of reactor water and a plant shutdown may have been required due to high drywell leakage. In addition, the isolation of the instrument gas system could have caused MSIV closure as the accumulators lost instrument gas pressure. This was avoided when the Instrument Gas System isolation was bypassed at 0748 hours.

There was no release of radioactive material to the environment as a result of this event.

Cause of the Event:

The root cause of this event is believed to be inadequate contact between the fuse and the fuse spring clips which resulted in higher operating fuse temperatures and eventual fuse failure.

The fuse is manufactured by Buss and is model No. KAJ-60.

Corrective Actions:

The operators verified that all isolations and automatic actions occurred as designed.

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TEXT (If more space is required, use additional NRC Form 366A 3/1/77)

At 0748 hours, operators bypassed the Instrument Gas system isolation to prevent MSIV closure and bypassed the Drywell Chilled Water System isolation to reestablish the supply of cooling water to the reactor recirculation pump motor air coolers.

At 0758 hours, operators reduced reactor power to 80% from 90% in order to reduce the heat load on the reactor recirculation pump seals due to the loss of the Reactor Enclosure Cooling Water (RECW) system.

The blown fuse was replaced at 0803 hours and the 1/2 SCRAM was reset. At 0807 hours, all NSSSS isolations were reset and all other systems which isolated were restored to normal.

Actions Taken to Prevent Recurrence:

A Temporary Circuit Alteration (TCA), No. 1374, was implemented to install Buss "Tron" fuse spring clip clamps on both the 'A' and 'B' RPS power supply fuses. These clamps have been installed to ensure better spring clip to fuse contact. Fuse temperatures were measured to verify that the newly installed spring clips were reducing fuse operating temperatures. These temperatures were found to have been reduced by as much as 100 degrees F.

The 'A' and 'B' channel RPS 60 amp power supply fuse spring clips will be inspected and replaced if necessary during an outage of sufficient duration.

EIIS Codes:

- FU - Fuse
- PB - Panel
- ANN - Annunciator
- HX - Heat Exchanger
- DRN - Drain
- VACB - Vacuum Breaker
- VTV - Vent Valve
- ISV - Isolation Valve
- P - Pump
- MO - Motor
- SEAL - Seal
- RLY - Relay

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

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

Previous Similar Occurrences:

There have been previous LERs involving a blown fuse at Limerick, however, none due to this cause.

Tracking Codes: B99, Other Deficiency - Design  
Manufacturing, Construction/Installation  
Deficiency

PHILADELPHIA ELECTRIC COMPANY

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10 CFR 50.73

(215) 841-4000

June 6, 1988

Docket No. 50-352

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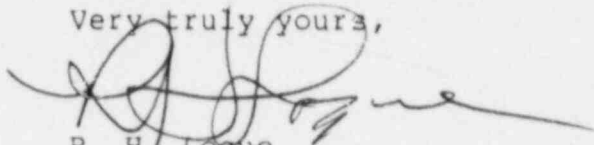
SUBJECT: Licensee Event Report  
Limerick Generating Station - Unit 1

This LER reports various Engineered Safety Feature actuations due to the loss of power to a Reactor Protection System logic panel as a result of a blown fuse.

Reference: Docket No. 50-352  
Report Number: 88-016  
Revision Number: 00  
Event Date: May 7, 1988  
Report Date: June 6, 1988  
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,



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

cc: W. T. Russell, Administrator, Region I, USNRC  
T. J. Kenny, NRC Senior Resident Inspector  
INPO Records Center

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