

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
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 SANATOGA, PENNSYLVANIA 19464
 (215) 327-1200 EXT. 2000

August 12, 1992

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 an inadvertent actuation of the Unit 1 and Unit 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICES), an Engineered Safety Feature, and other Engineered Safety Features, as a result of the blowing of a Unit 2 PCRVICES fuse due to an unknown cause.

Reference: Docket Nos. 50-352
 50-353
 Report Number: 2-92-008
 Revision Number: 00
 Event Date: July 17, 1992
 Report Date: August 12, 1992
 Facility: Limerick Generating Station
 P.O. Box 2300, Sanatoga, PA 19464-2300

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Very truly yours,

DMS:cah

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

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 PDR ADC 05000353
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 5 3 1	PAGE (3) 1 OF 0 4
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TITLE (4) Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) Engineered Safety Feature Actuations resulting from a PCRVICES fuse which blew.

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	7	1	7	9	2	9	2	0	0	8	0	0	0	8	1	2	9	2	Limerick, Unit 1	0 5 0 0 0 3 5 2
											0 5 0 0 0 1 1									

OPERATING MODE (8) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50. (Check one or more of the following) (11)									
POWER LEVEL (10) 1 0 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.38(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.38(e)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366-A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.405(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 G. J. Madsen, Regulatory Engineer, Limerick Generating Station	TELEPHONE NUMBER AREA CODE: 2 1 5 3 2 7 - 1 2 1 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																				
CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS											
X	J	M	F	V				B	5	6	9	N								

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

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

On July 17, 1992, various actuations of the Units 1 and 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICES), and a Unit 2 Reactor Enclosure Secondary Containment isolation occurred due to a blown fuse on Unit 2. These are Engineered Safety Feature actuations. The fuse was replaced and all isolations were reset within 41 minutes. The actual consequences of this event were minimal. All affected systems responded as designed and there was no release of radioactive material to the environment as a result of this event. The proximate cause of the isolations was the blowing of the Unit 2 PCRVICES fuse 821H-F15A. The root cause could not be determined and an investigation is continuing. The blown fuse has been sent to the manufacturer for failure analysis. A revision to this LER will be provided if any cause other than random equipment failure is identified during the investigation or failure analysis.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 2	— 0 0 8	— 0 0	0 2	OF	0 4

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

Unit Conditions Prior to the Event:

Unit 1 was in Operational Condition 1 (Power Operation) at 100% power level.

Unit 2 was in Operational Condition 1 at 100% power level.

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

Description of the Event:

On July 17, 1992, at 1910 hours, the Unit 2 Primary Containment and Reactor Vessel Isolation Control System (PCRVICES, EIIS:JM) fuse B214-F15A blew, causing a loss of power to the inboard PCRVICES logic that resulted in various actuations of the Units 1 and 2 PCRVICES. Additionally, a Unit 2 Reactor Enclosure Secondary Containment isolation occurred. These are Engineered Safety Feature (ESF) actuations.

The PCRVICES actuations resulted in isolation of the following Unit 2 systems or subsystems:

- o Reactor Water Cleanup (RWCU, EIIS:CE),
- o Primary Containment Instrument Gas (PCIG, EIIS:LK),
- o Drywell Chilled Water (DWCW, EIIS:KM),
- o Reactor Enclosure Cooling Water (RECW, EIIS:CC) to Reactor Recirculation Pump Motor coolers, and
- o Drywell Liquid Radwaste Drains (EIIS:WD).

Additionally, the Unit 1 Low Volume Primary Containment Nitrogen Make-up and Primary Containment Exhaust to the Reactor Enclosure Equipment Compartment Exhaust valves closed upon receipt of the isolation signal.

The following system lines received isolation signals but no valve motion occurred since the associated valves were in the normally closed position:

- o Unit 2 RECW Tie-in to DWCW,
- o Unit 2 Main Steam Line Drain,
- o Unit 2 Main Steam Lines Sample and Reactor Water Sample,
- o Unit 2 Suppression Pool Clean-up Pump (EIIS:CG) Suction,
- o Unit 2 Residual Heat Removal (RHR, EIIS:BO) Heat Exchanger Sample and RHR Drain to Radwaste,
- o Unit 2 RHR Heat Exchanger Vacuum Breaker (EIIS:VACB),
- o Unit 2 Primary Containment Exhaust to Reactor Enclosure Equipment Compartment Exhaust,
- o Unit 1 and 2 Primary Containment Nitrogen Inerting (EIIS:BB), and
- o Unit 1 and 2 Primary Containment Purge Supply and Exhaust.

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Limerick Generating Station, Unit 2	05000353	92	008	00	03	OF 04

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

The following ESFs also initiated as designed due to the PCRVICES actuations. The Unit 2 Reactor Enclosure (RE) Heating, Ventilation and Air Conditioning (HVAC) system isolated. The 'A' trains of the Standby Gas Treatment System (SGTS, EIIS:BM), a common plant system, and the Unit 2 Reactor Enclosure Recirculation System (RERS, EIIS:VA), automatically initiated thus completing the Unit 2 RE Secondary Containment isolation.

After plant personnel determined that the isolation signals were inadvertent, licensed Main Control Room (MCR) operators immediately bypassed the isolation signals for the isolated RECW to the Reactor Recirculation Pump Motor Cooler valves, and the DWCW valves in accordance with General Plant (GP) procedure GP-8.5, "Isolation Bypass of Crucial Systems." The operators restored the RECW and DWCW systems using PCRVICES isolation bypass switches. The Instrument Air system (EIIS:LD) was lined up to the unisolated PCIG header to serve as a back-up source of pressure. MCR operators replaced the blown fuse in the Auxiliary Equipment Room. All remaining isolations were reset by 1951 hours. The overall duration of the isolations was 41 minutes.

A four hour notification was made to the NRC at 2207 hours on July 17, 1992, in accordance with the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in automatic ESF actuations. Accordingly, this report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

Analysis of the Event:

The actual consequences of this event were minimal. All systems responded as designed. There was no release of radioactive material to the environment as a result of this event. The isolations were bypassed or reset in accordance with plant procedures and the affected systems were restored expeditiously by operators, preventing any adverse impact on other plant systems.

If RECW flow was not restored to the reactor recirculation pumps, the potential existed that this event could have resulted in a rapid plant shutdown. Plant shutdown could have also been required due to drywell temperature and pressure increases as a result of the isolation of the DWCW system and the resultant loss of drywell ambient cooling. Additionally, if the PCIG system was isolated for an extended period of time without a backup source of pressure, the Main Steam Isolation Valves (MSIVs) could have drifted closed, resulting in a reactor trip and subsequent challenges to safety-related systems.

If this event had occurred during an outage, the RHR Shutdown Cooling mode of operation would also have isolated. Off normal (ON) procedure ON-121, "Loss of Shutdown Cooling," provides MCR operations personnel with guidance to restore shutdown cooling in the event of an isolation which could not be bypassed nor reset using normal procedures.

Procedure GP-8 provides bypass and reset actions for this type of event. Licensed MCR operators receive requalification training to review and practice

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

responses to simulated plant transients of this type. This training reinforces immediate operator actions, minimizing the time that systems are isolated, and reducing the impact on the plant. Therefore, as a result of this adequate procedural guidance, training, and prompt operator actions, the consequences of this type of event are minimized.

Cause of the Event:

The cause of the isolations was the blowing of the PCRVICS fuse B21H-F15A, manufactured by Bussmann (Model No. MIN5). The root cause could not be determined and an investigation is continuing. An inspection of the PCRVICS circuitry is planned to look for a possible short which would draw excessive current through this fuse. This investigation is expected to be completed by August 14, 1992. A supplement to this LER will be issued if any cause other than random equipment failure is identified during the investigation.

Other plant activities ongoing at the time of the isolation were investigated to determine whether the blown fuse could have been caused by those activities; however, no cause could be identified.

Corrective Actions:

The blown fuse has been sent to the manufacturer, Bussmann, for failure analysis. This failure analysis is expected to be completed by August 21, 1992. A revision to this LER will be provided if any cause other than random equipment failure is identified during the failure analysis. We have determined that 5 amps is the appropriate fuse rating for this application, where operating current is approximately 1 amp.

Previous Similar Occurrences:

Limerick Generating Station LER 1-91-029 reported the failure of the same Unit 2 fuse B21H-F15A due to an unknown cause. The blown fuse was sent to the manufacturer, Bussmann, and the manufacturer concluded that the fuse blew due to an overcurrent condition. An investigation was performed and the root cause could not be identified.

Tracking Codes: X1 Failure with unknown cause