

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

P. O. BOX A

SANATOGA, PENNSYLVANIA 19464

(215) 327-1200 EXT. 2000

J. DOERING, JR.
PLANT MANAGER
LIMERICK GENERATING STATION

January 21, 1992
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, due to the failure of a Unit 2 PCRVICES fuse.

Reference: Docket Nos. 50-352
50-353
Report Number: 1-91-029
Revision Number: 00
Event Date: December 23, 1991
Report Date: January 21, 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,

KOS:cah

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

9201290062 920121
PDR ADDCK 05000353
S PDR

IE22

111

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **Limerick Generating Station, Unit 1** DOCKET NUMBER (2) **0 5 0 0 0 3 5 2 1** PAGE (3) **1 OF 0 4**

TITLE (4) **Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) actuations resulting from the failure of a PCRVICES fuse.**

EVENT DATE (5)			LSR NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)												
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES											
1	2	2	3	9	1	9	1	0	2	9	0	0	0	1	2	1	9	2	Limerick, Unit 2	0 5 0 0 0 3 5 3

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 C.F.R. § (Check one or more of the following) (11)

OPERATING MODE (9) 0	20.402(b)	20.405(d)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 1 0 1 0	20.405(a)(1)(i)	50.36(a)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(a)(2)	<input type="checkbox"/>	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text NRC Form 388A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)	
	20.405(a)(1)(v)	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 **2 1 5 3 2 7 - 1 2 0 0**

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	J M	F U	B 5 6 9	N					

SUPPLEMENTAL REPORT EXPECTED (14) YES (If yes, complete EXPECTED SUBMISSION DATE) NO EXPECTED SUBMISSION DATE (5) MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (15)

On December 23, 1991, various actuations of the Unit 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 30 minutes. The actual consequences of this event were minimal. All systems responded as designed and there was no release of radioactive material to the environment as a result of this event. The cause of the isolations was the failure of Unit 2 PCRVICES fuse B21H-F15A. The root cause of the fuse failure is unknown. The blown fuse will be sent to the manufacturer for failure analysis. A revision to this LER will be provided if anything significant is discovered during the failure analysis.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **Limerick Genera Station, Unit 1** DOCKET NUMBER (2) **6 | 5 | 0 | 0 | 0 | 3 | 5 | 2 | 1** OF **0 | 4** PAGE (3)

TITLE (4) **Primary Containment at Reactor Vessel Isolation Control System (PCRVICS) actuations resulting from the failure of a PCRVICS fuse.**

EVENT DATE (5) MONTH: 1 | DAY: 2 | YEAR: 3 | 9 | 1 | LER NUMBER (6) SEQUENTIAL NUMBER: 0 | 2 | 9 REGION NUMBER: 0 | 0 | 0 | 1 | REPORT DATE (7) MONTH: 9 | DAY: 2 | YEAR: 9 | 2 | OTHER FACILITIES INVOLVED (8) FACILITY NAME: **Limerick, Unit 2** DOCKET NUMBER (9) **0 | 5 | 0 | 0 | 0 | 3 | 5 | 3**

OPERATING MODE (10) **0** THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 43. Check one or more of the following (11):
 20.402(a) 20.405(a) 20.73(a)(2)(iv) 20.73(a)(2)(v)
 20.405(a)(1)(ii) 20.26(a)(1) 20.73(a)(2)(iv) 20.73(a)(2)(v)
 20.405(a)(1)(iii) 20.26(a)(2) 20.73(a)(2)(iv) 20.73(a)(2)(v)
 20.405(a)(1)(iv) 20.73(a)(2)(ii) 20.73(a)(2)(iv) 20.73(a)(2)(v)
 20.405(a)(1)(v) 20.73(a)(2)(iii) 20.73(a)(2)(iv) 20.73(a)(2)(v)
 20.405(a)(1)(vi) 20.73(a)(2)(ii) 20.73(a)(2)(iv) 20.73(a)(2)(v)

LICENSEE CONTACT FOR THIS LER (12) NAME: **G. J. Maesen, Regulatory Engineer, Limerick Generating Station** TELEPHONE NUMBER: **2 | 1 | 5 | 3 | 2 | 7 | - | 1 | 2 | 0 | 0**

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	JM	FU	B 5 6 9	N					

SUPPLEMENTAL REPORT EXPECTED (14) YES NO EXPECTED SUBMISSION DATE (15) MONTH: | DAY: | YEAR: |

On December 23, 1991, various actuations of the Unit 1 and 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICS), 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 30 minutes. The actual consequences of this event were minimal. All systems responded as designed and there was no release of radioactive material to the environment as a result of this event. The cause of the isolations was the failure of Unit 2 PCRVICS fuse B21H-F15A. The root cause of the fuse failure is unknown. The blown fuse has been sent to the manufacturer for failure analysis. A revision to this LER will be provided if anything significant is discovered during the failure analysis.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENCE NUMBER	REVISION NUMBER		
Limerick Generating Station, Unit 1	0 1 9 1 0 1 0 1 3 1 5 1 2	9 1 1	— 0 1	— 9	— 0 1 0	0 1 2 OF 0 1 4

TEXT (if more space is required, use additional NRC Form 3658's (17))

Unit Conditions Prior to the Event:

Unit 1 was in Operational Condition 4 (Cold Shutdown) at 0% power level.

Unit 2 was in Operational Condition 1 (Power Operation) at 100% power level.

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

Description of the Event:

On December 23, 1991 at 0916 hours, Unit 2 fuse B21H-F15A blew, causing loss of power to inboard PCRVICS logic which resulted in various actuations of the Units 1 and 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICS, EIIS:JM). Additionally, a Unit 2 Reactor Enclosure Secondary Containment isolation occurred. These are Engineered Safety Feature (ESF) actuations.

The PCRVICS actuations resulted in isolation of the following Unit 2 systems or subsystems by closing their inboard primary containment isolation valves:

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

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 1 and 2 Primary Containment Nitrogen Inerting (EIIS:BB),
- o Unit 1 and 2 Primary Containment Purge Supply and Exhaust, and
- o Unit 1 and 2 Primary Containment Exhaust to Reactor Enclosure Equipment Compartment Exhaust.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Limerick Generating Station, Unit 1	0 15 10 10 10 13 15 12	9 1 1	0 1 2 1 9	0 1 0	0 1 3	OF 0 4

TEXT IS THIS SPACE IS REQUIRED, USE ADDITIONAL NRC FORM 366A (11)

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, EISS:BM) a common plant system, and the Unit 2 Reactor Enclosure Recirculation System (RERS, EISS:VA), automatically initiated thus completing the Unit 2 RE Secondary Containment isolation.

After determining that the isolation signals were inadvertent, licensed Main Control Room (MCR) operators immediately bypassed the isolation signals for the isolated RFCW Recirculation Pumps Cooling, PCIG, and DWCW valves in accordance with General Plant (GP) procedure GF-8.5, "Isolation Bypass of Crucial Systems." The operators restored the RECW, PCIG and DWCW systems within four minutes using PCRVICES isolation bypass switches. MCR operators replaced the blown fuse in the Auxiliary Equipment Room. All remaining isolations were reset by 0946 hours. The overall duration of the isolations was 30 minutes.

A four hour notification was made to the NRC at 1254 hours on December 23, 1991, in accordance with the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in automatic ESF actuations. 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 systems were restored expeditiously by operators, preventing any adverse impact on plant systems.

If RECW cooling water flow was not restored to the reactor recirculation pumps by licensed MCR operators, the potential exists 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 cooling. Additionally, if the PCIG system was isolated for an extended period of time, 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.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Limerick Generating Station, Unit 1	0 1 5 0 0 0 1 3 5 2	9 1	0 2 9	0 1 0	0 4	OF 0 4

TEXT (if more space is required, use additional NRC Form 2054's (1))

Procedure GP-8 provides bypass and reset actions for this type of event. Licensed PCR operators receive requalification training to review and practice response 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 failure of PCRVICS fuse B21H-F15A, manufactured by Bussmann (Model No. MI15). The root cause of the fuse failure is unknown.

Other plant activities ongoing at the time of the isolations were investigated to determine whether the blown fuse could have been caused by those activities; however, no connection between the activities and the blown fuse was identified.

Corrective Actions:

The blown fuse will be sent to the manufacturer, Bussmann, for failure analysis. A revision to this LER will be provided if anything significant is identified during the failure analysis. It has been determined that the 1 amp fuse is the appropriate rating for this application, where operating current is approximately 1 amp.

Previous Similar Occurrences:

Three Unit 1 LERs in 1985 (1-85-008, 1-85-048, 1-85-074) reported failure of Unit 1 fuse B21H-F15A, two of which were due to unknown causes. Unit 2 fuse B21H-F15A has never failed.

Tracking Codes: X1 Failure with unknown cause