



PECO ENERGY

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10CFR50.73

October 13, 1995
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 actuation of the Unit 1 and Unit 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICS), Engineered Safety Features, as a result of a blown Unit 1 PCRVICS fuse which occurred when a technician inadvertently grounded a starter screwdriver.

Reference:	Docket Nos. 50-352 50-353
Report Number:	1-95-004
Revision Number:	01
Event Date:	July 28, 1995
Report Date:	October 13, 1995
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-2300

This revision provides clarification to the time when this event occurred. The change is indicated by a revision bar mark in the right hand margin. This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Very truly yours,

DMS:cen

cc: T. T. Martin, Administrator Region I, USNRC
N. S. Perry, USNRC Senior Resident Inspector, LGS

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PDR ADDCK 05000352
S PDR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Limerick Generating Station, Unit 1	DOCKET NUMBER (2) 05000 352	PAGE (3) 1 OF 5
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TITLE (4) Actuations of the Unit 1 and Unit 2 PCRVICES resulting from a blown fuse when an I&C Technician inadvertently grounded a starter screwdriver.

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 NAME	DOCKET NUMBER
07	28	95	95	-- 004 --	01	10	13	95	Limerick, Unit 2	05000353
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
	20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)			
POWER LEVEL (10) 100%	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)			
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER			
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)			
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)					
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)					

LICENSEE CONTACT FOR THIS LER (12)										
NAME J. L. Kantner, Manager Experience Assessment, LGS								TELEPHONE NUMBER (Include Area Code) (610) 718-3400		

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO						

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 7/28/95, during restoration of a Surveillance Test (ST) procedure, various actuations of the Units 1 and 2 Primary Containment and Reactor Vessel Isolation Control System occurred due to a blown fuse on Unit 1. The fuse blew after an Instrumentation and Controls (I&C) technician inadvertently grounded a starter screwdriver. The fuse was replaced and all isolations were reset within 91 minutes. The actual consequences of this event were minimal, and all affected systems responded as designed. Corrective actions for a previous similar event committed to searching for, but could not identify, more reliable techniques or tools. Absent an alternative, existing techniques were deemed appropriate and reinforced through formal communications. As a result of a licensee assessment subsequent to the closure of this previous event's corrective actions, a more reliable method for lifting leads was identified. This solution had been implemented in selected applications but had not yet been incorporated into I&C ST procedures. A review of appropriate I&C ST procedures will be performed to identify where physical modifications can minimize or eliminate the need to lift a lead. A similar review will be performed by other plant groups and a station bulletin will be issued to address the generic implications of this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		95	-- 004 --	01	

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

Unit Conditions Prior to the Event:

Unit 1 was in Operational Condition 1 (Power Operation) operating at 100% power. Unit 2 was in Operational Condition 1 operating 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 28, 1995, Instrumentation and Controls (I&C) technicians were performing Surveillance Test (ST) procedure ST-2-042-938-1, "RPS/NS4 Drywell Pressure High, Division IIA, Channel C Response Time Test." At 1517 hours, while performing the restoration section of the ST procedure, a technician inadvertently grounded a starter screwdriver (i.e., self-holding) to the case of an electrical relay while attempting to reconnect an electrical lead.

The short circuit caused the Unit 1 Primary Containment and Reactor Vessel Isolation Control System (PCRVICS, EIIS:JM) fuse B21H-F15D to blow, causing a loss of power to the outboard PCRVICS logic that resulted in various actuations of the Units 1 and 2 PCRVICS. These are Engineered Safety Feature (ESF) actuations.

The PCRVICS actuations resulted in isolation of the following Unit 1 systems or subsystems:

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

Additionally, the Unit 2 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 positions:

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

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

The I&C technicians immediately notified the Main Control Room (MCR) following the incident, and licensed MCR operators immediately bypassed the isolation signals for the isolated RECW valves to the Reactor Recirculation Pump Motor Cooler, 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 PCRVICS 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 restored by 1648 hours, and the overall duration of the isolations was 91 minutes. The I&C technicians then satisfactorily completed the ST procedure at 1721 hours.

A four hour notification was made to the NRC at 1813 hours on July 28, 1995, 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, thereby preventing any adverse impact on other plant systems.

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

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 could have drifted closed, resulting in a reactor trip and subsequent challenges to safety-related systems.

Procedure GP-8 provides bypass and reset actions for this type of event. Licensed MCR operators receive requalification training to review and practice 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 a blown PCRVICES fuse (B21H-F15D). The fuse blew when the technician inadvertently grounded a starter screwdriver to the case of an energized relay while he attempted to reconnect an electrical lead.

Limerick Generating Station (LGS) LER 2-94-003 reported a similar event. In this case, the fuse blew when a technician failed to ensure that a screw for reconnecting an energized lead was properly secured in a starter screwdriver; the screw dislodged from the screwdriver and the electrical lead short circuited. The completed corrective actions for this previous event committed to searching for, but could not identify more reliable techniques or tools. The existing techniques for lifting leads were reinforced through formal communications to the I&C technicians with the major reliance remaining on the skill of the technician.

As a result of a licensee assessment subsequent to closure of the previous event's corrective actions, a more reliable method for lifting leads was identified involving a new style wire connector (i.e., a gray boot connector). This solution had been implemented in selected applications but had not yet been incorporated into the I&C

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

ST procedures prior to the event reported in this LER. The continued use of the existing techniques were deemed to be acceptable until the evaluation of the application of the new connector.

Corrective Actions:

1. A station bulletin will be issued by September 30, 1995, to all LGS supervision, addressing this event and its implications for all electrical lead lifting activities.
2. A review of I&C ST procedures will be performed to identify those procedures that require a technician to lift and reconnect an electrical lead. Each affected procedure will then be revised to incorporate one of the following:
 - a. Installation of a gray-boot connector eliminating the need to lift an electrical lead.
 - b. Installation of a fork tongue lug eliminating the need to remove the terminal screw.

The above procedure reviews will be completed by December 1, 1995. The subsequent physical modifications and/or procedure revisions will then be completed prior to or during the next performance of the affected procedure.

3. The Maintenance Procedure M-C-700-200, "Lifting and Landing of Electrical Leads," and the I&C Procedure IC-11-00100, "Documentation of Temporary Lifted Leads and Jumpers," will be revised by September 15, 1995, to incorporate cautions and specific directions concerning the actions to take in situations where shorts and grounds have a high probability of occurrence.
4. The criteria described in corrective action 2 above will be assessed for incorporation by other LGS work groups that lift electrical leads by December 31, 1995.

Previous Similar Occurrences:

LGS LER 2-94-003 reported a similar occurrence involving a lifted lead and the previous corrective actions are discussed in the cause section of this report.