

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
 P. O. BOX A
 SANATOGA, PENNSYLVANIA 19464

(215) 327-1200 EXT. 2000

December 20, 1990

Docket No. 50-352
 License No. NPF-39

M. J. MCCORMICK, JR., P.E.
 PLANT MANAGER
 LIMERICK GENERATING STATION

U.S. Nuclear Regulatory Commission
 Attn: Document Control Desk
 Washington, DC 20555

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

The LER reports a Reactor Protection System (RPS) actuation when an Intermediate Range Monitor (IRM) spiked upscale due to a loose cable connector coincident with performance of RPS surveillance testing on another IRM.

Reference:	Docket Nos. 50-352
Report Number:	1-90-027
Revision Number:	00
Event Date:	November 20, 1990
Report Date:	December 20, 1990
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,

DMS:rgs

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

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 5 1 2 1	PAGE (3) 1 OF 0 3
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TITLE (4) Reactor Protection System (RPS) Actuation When an Intermediate Range Monitor Spiked Upscale due to a Loose Cable Connector Coincident with Performance of PPS Testing

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
1	1	2 0 9 0	9 0	0 2 7	0 1	2 2	0 9 0		0 5 0 0 0

OPERATING MODE (9) 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)							
POWER LEVEL (10) 0 0 0	20.402(b)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	<input type="checkbox"/>	73.71(b)			
	20.405(a)(1)(i)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(c)			
	20.405(a)(1)(ii)	<input type="checkbox"/>	50.73(a)(2)(vi)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 365a)			
	20.405(a)(1)(iii)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)	<input type="checkbox"/>				
	20.405(a)(1)(iv)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)	<input type="checkbox"/>				
	20.405(a)(1)(v)	<input type="checkbox"/>	50.73(a)(2)(viii)	<input type="checkbox"/>				

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 0 0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (15) <input type="checkbox"/> (yes, complete EXPECTED SUBMISSION DATE)	NO <input checked="" type="checkbox"/>	EXPECTED SUBMISSION DATE (16)
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (17)

On November 20, 1990, at 0651 hours, a Unit 1 reactor scram signal occurred. Since all of the control rods were fully inserted prior to the scram, no control rod motion occurred. The reactor scram occurred when the 'F' Intermediate Range Monitor (IRM) spiked upscale causing a Reactor Protection System (RPS) Channel 'B' half scram. At the time of the RPS Channel 'B' half scram, a RPS Channel 'A' half scram already existed as part of the performance of functional testing on the 'C' IRM. The reactor scram was satisfactorily reset at 0703 hours. At 0705 hours, the 'F' IRM was bypassed and declared inoperable to prevent another RPS Channel 'B' half scram. The consequences of this event were minimal and there was no release of radioactive material to the environment. The cause of the event was an equipment problem that occurred coincident with performance of a RPS surveillance test procedure. The cause of the 'F' IRM upscale spike was determined to be a loose undervessel cable connector resulting from cable movement to support Control Rod Drive maintenance. The loose cable connector for the 'F' IRM was tightened and tested by 1330 hours on November 20, 1990. On November 21, 1990, technicians performed an inspection of each Source Range Monitor and IRM undervessel cable connector to ensure tightness. No other loose connectors were identified. Plant Staff will evaluate the need to take further precautions on a case by case basis. A message will be sent on Nuclear Network to determine if other utilities have experienced similar problems.

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		0 8 0 0 0 3 5 2	9 0	0 2 7	0 0	0 2	0 3

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

Unit Conditions Prior to the Event:

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

Unit 1 was in a refueling outage. Instrumentation and Controls (I&C) technicians were performing the 'C' Intermediate Range Monitor (IRM) Functional Surveillance Test (ST) procedure, ST-2-074-610-1. This testing caused a Reactor Protection System (RPS, EIIS:IC) Channel 'A' half scram signal to exist. Additionally, at approximately 0500 hours on November 20, 1990, another group of I&C technicians had untied Source Range Monitor (SRM) and IRM undervessel cables following completion of Control Rod Drive (CRD) leakage repair outage work. The cables had been lifted and tied to preclude damage and to allow access for the repair of the leaking CRDs.

Description of the Event:

On November 20, 1990, at 0651 hours, the Unit 1 Main Control Room (MCR) Reactor Operator (RO) observed that a full reactor scram signal occurred. Since all of the control rods were fully inserted prior to the scram, no control rod motion occurred. The reactor scram occurred after the 'F' IRM spiked upscale causing a RPS Channel 'B' half scram. At the time of the RPS Channel 'B' half scram, a RPS Channel 'A' half scram already existed as part of the performance of functional testing on the 'C' IRM. At 0652 hours, the Unit 1 RO also observed and acknowledged a Rod Drive Control System (RDCS) trouble annunciator. Subsequently, the scram was reset in accordance with General Procedure GP-11, "RPS-Scram Reset"; however, following the scram reset, the Reactor Full Core Display (RFCD) indicated that not all of the Control Rod Drive (CRD) Hydraulic Control Unit (HCU)(EIIS:HCU) inlet and outlet valves had closed. Therefore, in accordance with procedure GP-11, a manual scram was inserted by the RO at 0659 hours. The RDCS annunciator was reset in the Auxiliary Equipment Room (AER) at 0702 hours, and the CRD HCU inlet and outlet valves were verified closed on the RFCD in the MCR. The RO then satisfactorily reset the manual scram at 0703 hours. At 0705 hours, the RO bypassed the 'F' IRM input to RPS and declared it inoperable to prevent another RPS Channel 'B' half scram.

A four hour notification was made to the NRC at 0918 hours on November 20, 1990, in accordance with 10 CFR 50.72 (b)(2)(ii) since this event resulted in an automatic actuation of the RPS. This LER is being submitted in accordance with the requirements of 10 CFR 50.73 (a)(2)(iv).

Analysis of the Event:

There was no control rod motion during the reactor scram since all control rods were fully inserted prior to the event. Procedure ST-2-074-610-1 is not performed during a reactor startup or normal reactor power operations. Had an IRM upscale spike occurred during a reactor startup as a result of reactor undervessel work, only a half scram actuation would have been initiated, which

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TEXT IF more space is required, use additional NRC Form 305A (11/77)

would not have produced any control rod motion. Additionally, the RPS inputs from the IRMs are bypassed when the Reactor Mode Switch is placed in RUN (Operational Condition 1-Power Operation). Therefore, an IRM upscale spike would have had no adverse impact on normal reactor power operation. There was no release of radioactive material to the environment as a result of this event. Therefore, the actual and potential consequences of this event were minimal.

Cause of the Event:

The cause of the event was an equipment problem that occurred coincident with performance of a RPS ST procedure. The cause of the 'F' IRM upscale spike was determined to be a loose undervessel cable connector. The loose cable connector was caused by repetitive lifting, tying, and untying of undervessel SRM and IRM cables to allow refueling outage maintenance work on leaking CRDs. The cables were lifted and tied to preclude damage. The CRD leak repair work was completed and the IRM cables were untied by 0500 hours on November 20, 1990, approximately two hours prior to the Unit 1 reactor scram.

The cause of the RDCS trouble annunciator was determined to be a failed transponder card, due to normal wear.

Corrective Actions:

The loose cable connector for the 'F' IRM was tightened and tested by 1330 hours on November 20, 1990. On November 21, 1990, I&C technicians performed an inspection of each SRM and IRM undervessel cable connector to ensure tightness. No other loose connectors were identified. The failed transponder card for RDCS was replaced by I&C technicians on November 20, 1990.

Manipulation of IRM cables during CRD work is a known and necessary operation. There is always some degree of risk with regard to spiking of the IRM system by contact or connector loosening. I&C will continue the normal practice of verifying that there is no unusual IRM channel spiking prior to proceeding with opposite channel testing. Plant Staff will evaluate the need to take further precautions (i.e. full inspection) on a case by case basis. The Nuclear Network System will be utilized to determine if other utilities have experienced RPS actuations due to undervessel IRM connector loosening. If any significant findings are identified, a supplement to this report will be provided.

Previous Similar Occurrences:

LER 1-88-013 reported a reactor scram actuation during Cold Shutdown (Mode 4) when an IRM spiked upscale due to a defective detector. The actions taken to prevent recurrence for LER 1-88-013 would not have prevented this event because the causes were different.

Tracking Code: X2 Failure that cannot be assigned from codes