



PECO ENERGY

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10CFR50.73

September 27, 1995
Docket No. 50-352
License No. NPF-39

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER reports an Unusual Event and Reactor Protection System actuation after the reactor was manually shutdown as a result of a leak into the Primary Containment complicated by the normal low power feedwater level control valve being unavailable.

Reference:	Docket No. 50-352
Report Number:	1-95-006
Revision Number:	00
Event Date:	August 28, 1995
Report Date:	September 27, 1995
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
N. S. Perry, USNRC Senior Resident Inspector, LGS

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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) Unusual Event & RPS Actuation After the Reactor was Manually Shutdown due to a Leak Into the Primary Containment & Temporary Loss of the Normal Startup Level Control Valve.

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
08	28	95	95	-- 006 --	0	09	27	95	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) 2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 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)(i)	<input type="checkbox"/>	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(c)		
	<input type="checkbox"/>	20.405(a)(1)(ii)	<input type="checkbox"/>	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	<input type="checkbox"/>	OTHER		
	<input type="checkbox"/>	20.405(a)(1)(iii)	<input type="checkbox"/>	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)			
	<input type="checkbox"/>	20.405(a)(1)(iv)	<input type="checkbox"/>	50.73(a)(2)(ii)	<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)(x)					

LICENSEE CONTACT FOR THIS LER (12)									
NAME J. L. Kantner - Manager, Experience Assessment							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).	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>					

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

On 08/28/95 at 0652 hours, the reactor was manually shutdown, a Reactor Protection System actuation, due to high leakage into the Primary Containment. An Unusual Event was declared as a result of high leakage into the Primary Containment and complications prior to the shutdown resulting from the normal low power feedwater level control valve (FWLCV) being unavailable. The FWLCV was unavailable due to the 'A' Reactor Feedwater Pump being secured as a result of temperature recorder problems. Operations personnel successfully controlled the manual shutdown using the appropriate plant procedures, and all control rods fully inserted. The low power FWLCV was returned to service and reactor pressure vessel level was stabilized. On 08/30/95 at approximately 1400 hours, a flange on an instrument line connected to the reactor head was determined to be misaligned and leaking. The cause of the misalignment resulted from the difficulty of this particular flange to be reassembled, an inadequate Maintenance procedure, and an inadequate task follow-through by a Maintenance Foreman. The corrective actions included an All Hands meeting on this event, a best practice revision to the procedure for reassembly of this flange, and a review of procedure steps for all reactor vessel disassembly/reassembly activities.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1	05000-352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		95	-- 006 --	0	

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

Unit Conditions Prior To The Event:

On August 28, 1995, Unit 1 was in Operational Condition (OPCON) 2 (Startup) following an 8-day maintenance outage to replace a failed fuel bundle.

Description of the Event:

On August 28, 1995, at 0652 hours, the reactor was manually shutdown, a Reactor Protection System (RPS, EIIS:JC) actuation, due to high Primary Containment leakage. Additionally, an Unusual Event was declared as a result of the activities that led to the manual shutdown. A brief description of this event is as follows:

At approximately 0628 hours, the 'Drywell Equipment Drain Tank/Floor Drain Sump Leakage HI Flow' alarm annunciated in the Main Control Room (MCR). The drywell floor drain flow monitor indicated a leak rate of approximately 3 gpm. At approximately 0630 hours, a series of temperature alarms were received for the 'A' Reactor Feedwater Pump (RFP, EIIS:SJ) bearings. The RFP turbine temperature recorder, TRS-019-114, was checked and increasing temperature trends were observed for 3 different bearing parameters. As a precaution until the 'A' RFP and the temperature recorder could be inspected, the MCR Shift Supervisor (SSV) directed a Reactor Operator (RO) to secure the 'A' RFP. This resulted in the normal low power (i.e., startup) feedwater level control valve, LV-C-006-138A (EIIS:LCV), being unavailable.

At 0635 hours, Operational Transient (OT) Procedure OT-101, "High Drywell Pressure," was entered due to drywell pressure reading 0.8 psig with increased flow indication on the drywell floor drain flow monitor. The MCR SSV then directed the Unit 1 RO to commence reducing reactor pressure to 500 psig to reduce the leak into the drywell. As reactor pressure was reduced toward 500 psig, the RO had difficulty in controlling reactor level since the A RFP was out of service and the startup feedwater level control valve was not in service. At 0652 hours, due to the difficulty in controlling reactor water level and the apparent leak into the Primary Containment, SSV directed the reactor mode switch be placed to shutdown.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1	05000-352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		95	-- 006 --	0	

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

Trip (T) Procedure T-100, "Scram," was entered and appropriate actions were performed. Procedure T-100 was exited and T-99, "Post-Scram Restoration," was entered at 0653 hours. At 0658 hours, the scram was reset per General Plant (GP) Procedure GP-11, "Scram Reset." At 0713 hours, normal reactor depressurization towards OPCON 4, "Cold Shutdown," commenced.

While the unit was being depressurized, an inspection of the temperature recorder (i.e., TRS-019-114, EIIS:TR) was performed by Instrumentation and Controls personnel. This inspection identified the recorder to be malfunctioning, thereby allowing the 'A' RFP to be returned to an operable status. Additionally, an inspection of the Primary Containment was performed by Maintenance personnel and did not reveal any substantial leakage. A review of the data for the 1CV-212 and 1DV-212 Primary Containment unit coolers (EIIS:VB) indicated high inlet temperatures with high condensate flows. Both of these unit coolers take their suction above the reactor seal plate, thereby indicating a potential leak within the reactor head gasket area. On August 30, 1995 at approximately 1400 hours, following disassembly and pressurization tests, a flange on an instrument line connected to the reactor head was determined to be leaking.

A one-hour notification was made to the NRC at 0813 hours on August 28, 1995, in accordance with the requirements of 10CFR50.72(a)(1)(i) after an Unusual Event (UE) was declared for Unit 1 due to the manual shutdown initiated as a result of the leak into the Primary Containment complicated by the temporary loss of the normal startup feedwater level control valve during the transient. This notification also included the manual RPS actuation in accordance with the requirements of 10CFR50.72(b)(2)(ii). On August 28, 1995 at 0838 hours, a notification was made to the NRC in accordance with station Emergency Plan procedures after the Emergency Director completed the event recovery checklist and terminated the UE. This report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

Analysis of the Event:

MCR Operations personnel successfully controlled the manual plant shutdown using appropriate plant procedures, and all control rods fully inserted as designed. No Emergency Core Cooling Systems were

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
Limerick Generating Station, Unit 1	05000-352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
		95	-- 006 --	0
				4 OF 5

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

required due to adequate core cooling throughout the event. There was no release of radioactive materials to the environment as a result of this event. An inspection of the flange faces revealed no damage. Therefore, the consequences of the manual shutdown and the flange leak were minimal.

During the depressurization, it was difficult to control reactor pressure vessel level since the low power feedwater level control valve, LV-C-006-138A, was out of service. This resulted in a temporary high level in the reactor pressure vessel. Level was in the process of being reduced and brought under control, however, the SSV recognized it would be difficult to maintain consistent level control without LV-C-006-138A in service. Therefore, the SSV conservatively manually shutdown the plant.

Cause of the Event:

The cause of the flange on the instrument line connected to the reactor head leak was due to the technicians misaligning the flange connection. This misalignment resulted from the following:

- This flange is unique and very difficult to properly assemble. This is due to the flange connection being recessed making access and visual inspection difficult, and due to the loading of the flange by the piping supports. It is difficult for the technician to verify that the flange tongue is adequately in its groove, and to tighten the nuts and bolts.
- The Maintenance (M) Procedure M-041-400, "Reactor Pressure Vessel Reassembly," was inadequate. This unique flange, due to the loading on the flange, requires support aids or the use of guide pins. Also, due to the flange position, gap measurements are required. However, 'normal' flange assembly qualification training recommends that a flange be aligned via visual inspection of the bolt holes and flange gap.
- This particular flange has failed leakage tests in the past. One of these corrective actions, to obtain gap measurements for this flange, was not effectively incorporated into the flange reassembly procedure.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Limerick Generating Station, Unit 1	05000-352	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		95	-- 006 --	0	

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A contributing factor to this event was inadequate follow through by a Maintenance Foreman. The technicians notified the foreman of problems aligning the flange, however, the foreman did not follow through on his recollection of using guide pins during past flange reassemblies.

Corrective Actions:

1. On September 15, 1995, an All Hands meeting was conducted with all Nuclear Maintenance Division-Reactor Services Section personnel to discuss the lessons learned from this event and to solicit ideas for enhancing human performance. This discussion also conveyed the need to involve essential personnel during a complex evolution, and to stop the work activity when uncertainty arises.
2. Procedure M-041-400 will be revised prior to the next reactor head flange disassembly to require the use of guide pins or another acceptable method to ensure that the flange tongue remains in its groove as it is tightened. The requirement of obtaining flange gap measurements will also be incorporated in this revision.
3. A review of the procedure M-041-400 and the procedure M-041-200, "Reactor Pressure Vessel Disassembly," will be performed. This review will ensure that the necessary details for the various activities used to disassemble and reassemble the reactor vessel exist.

Previous Similar Occurrences:

There have been no previous Limerick Generating Station LERs that reported a similar event. In May 1992, the flange on the instrument line connected to the reactor head failed 2 shutdown leakage tests due to misalignments. The first misalignment was due to extra gaskets being left in downstream flanges. The second misalignment was due to inadequate knowledge regarding flexitallic gasket installation.