



PECO ENERGY

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10CFR 50.73

September 9, 1994  
Docket No. 50-353  
License No. NPF-85

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

SUBJECT: Licensee Event Report  
Limerick Generating Station - Unit 2

This LER concerns an event where the plant was in a condition that was outside the requirements of the Facility Operating License NPF-85 Section 2.E, resulting in a non-compliance with License Condition 2.C.1. The Unit 2 maximum power level of 100% was exceeded by approximately 2.6% power. The power excursion is believed to be caused by a malfunction of the scoop tube positioner servo amplifier for the 'A' recirculation pump motor/generator set.

Reference:	Docket No. 50-353
Report Number:	2-94-008
Revision Number:	00
Event Date:	August 13, 1994
Report Date:	September 9, 1994
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-2300

This LER is being submitted pursuant to the requirements of License Condition 2.E, which requires a 30-day written follow-up report.

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)

FACILITY NAME (1) Limerick Generating Station, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 5 3				PAGE (3) 1 OF 0 3	
TITLE (4) Unit 2 maximum power level of 100% exceeded by approximately 2.6%, due to a malfunction of the 'A' recirculation pump M/G set scoop tube positioner servo amplifier.															
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	8	13	94	008		0	9	94					0 5 0 0 0		
OPERATING MODE (9) 1			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)												
POWER LEVEL (10) 0 9 9			20.402(b)			20.405(e)			50.73(a)(2)(iv)			73.71(b)			
			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)			X OTHER (Specify in Abstract below and in Text, NRC Form 366A)			
			20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)			License			
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)			Condition 2.E			
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(ix)						
LICENSEE CONTACT FOR THIS LER (12)															
NAME J. L. Kantner, Manager - Experience Assessment, LGS										TELEPHONE NUMBER AREA CODE 6 1 0 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					
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 fifteen single space typewritten lines) (16)

On 08/13/94, the 'A' Motor/Generator (M/G) set scoop tube positioner inadvertently increased the M/G set speed, resulting in an increase of speed on the 'A' reactor recirculation pump. As expected, this increased reactor core flow added positive reactivity to the reactor core, thereby raising reactor core power to approximately 102.6%. Within one minute following the transient, the reactor operator lowered reactor power to less than 100%. A notification was made per the Facility Operating License NPF-85 Section 2.E, since a non-compliance with License Condition 2.C.1 resulted, which specifies a maximum power level of 100%. The actual consequences of this event were minimal. A review of Section 15 of the Updated Final Safety Analysis Report showed that this event is bounded by an event explicitly analyzed. The reactor power excursion occurred during an electrical transient when a 500 kilo-volt transmission line tripped during a storm, causing the 'A' M/G set scoop tube positioner to inadvertently increase the M/G set speed. An investigation identified that the inadvertent positioner increase is believed to be due to an increased sensitivity with the scoop tube positioner servo amplifier. The problem is isolated to the 'A' recirculation pump M/G set. Adjustment of this amplifier is planned to be completed by 09/30/94.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)  Limerick Generating Station, Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 3 5 B	LER NUMBER (6)			PAGE (3)		
		YEAR  9 4	SEQUENTIAL NUMBER  - 0 0 8	REVISION NUMBER  - 0 0 0			

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

Unit Conditions Prior to the Event:

Unit 2 was in Operational Condition 1 (Power Operation) at 99.9% power level. There were no structures, systems, or components out of service that contributed to this event.

Description of the Event:

On August 13, 1994 at 1813 hours, during a storm-related electrical transient, the 'A' Motor/Generator (M/G) set scoop tube positioner inadvertently increased the M/G set speed, resulting in an increase of speed on the 'A' reactor recirculation pump. As expected, this increased reactor core flow added positive reactivity to the reactor core, thereby raising reactor core power to approximately 102.6%. Within one minute following the transient, the Main Control Room (MCR) reactor operator lowered reactor power to less than 100%, utilizing reactor core flow.

A 24-hour notification was made to the NRC at 1703 hours on August 14, 1994, in accordance with the requirements of the Facility Operating License NPF-85 Section 2.E, since this event resulted in a non-compliance with License Condition 2.C.1. License Condition 2.C.1 provides authorization to operate the Unit 2 reactor at a maximum reactor core power level of 100% rated power. This report is being submitted in accordance with License Condition 2.E which requires a 30-day written follow-up report.

Analysis of the Event:

The actual consequences of this event were minimal, and there was no release of radioactive material to the environment as a result of this event. The MCR reactor operator expeditiously lowered reactor power below 100%, thereby preventing any adverse effects on plant systems.

Since the duration of the power increase was very short (i.e., less than one minute), steam flow and neutron flux were utilized to determine the extent of the reactor power increase because of their sensitivity to reactor power changes. A review of reactor and main turbine steam flows indicated a maximum increase of 2.7% and 2.4% respectively. Reactor power prior to the event was 99.9%. Correlating a 1% increase in steam flow to a 1% change in reactor power, the maximum reactor power that was reached was 2.6% above the 100% power value. Additionally, neutron flux was used to determine the reactor power (i.e., heat flux) during this event. The neutron flux response from the 'A' Average Power Range Monitor was input into a transient fuel bundle simulation model. The results indicated that the peak heat flux was approximately 102.97% of the licensed limit.

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

A review of Section 15 of the Updated Final Safety Analysis Report (UFSAR) showed that this event is bounded by the an event explicitly analyzed. Section 15.4.5, "Recirculation Flow Control Failure With Increasing Flow", addresses a speed increase of one reactor recirculation pump resulting in a heat flux increase of 25.7% of rated. The design basis for this transient is the Maximum Critical Power Ratio (MCPR) safety limit, and the MCPR remains above the safety limit. The event being reported also involves the speed increase of one reactor recirculation pump with a heat flux increase of 2.97% of rated. The UFSAR results bound the actual event and all design basis criteria are satisfied.

Cause of the Event:

The reactor power excursion occurred during an electrical transient when a 500 kilo-volt transmission line tripped during a storm, causing the 'A' M/G set scoop tube positioner to inadvertently increase the M/G set speed. As a result, the 'A' reactor recirculation pump flow increased, thereby raising reactor core power to approximately 102.6%. Based upon an extensive investigation and engineering knowledge, we believe that the cause of the inadvertent positioner increase is due to an increased sensitivity of the scoop tube positioner servo amplifier for the 'A' recirculation pump M/G set. Bus voltage drops and negative speed demands cause the positioner to overshoot. Additionally, further investigation identified that this problem is isolated to the Unit 2 'A' M/G set scoop tube positioner.

Corrective Actions:

Adjustment of the servo amplifier for the 'A' recirculation pump M/G set is planned to be completed by September 30, 1994.

Previous Similar Occurrences:

None