

December 30, 2008

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Limerick Generating Station, Unit 1  
Facility Operating License No. NPF-39  
NRC Docket No. 50-352

Subject: LER 2008-003-00, High Pressure Coolant Injection  
System Instrument Power Supply Failure

This Licensee Event Report (LER) addresses an event that could have prevented the fulfillment of the High Pressure Coolant Injection system safety function due to oscillations in the system flow indication. The condition was corrected by recalibration of a flow transmitter, replacement of a square root converter, and replacement of a degraded inverter in the turbine control system.

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D).

There are no commitments contained in this letter.

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

Original signed by Edward W. Callan for Christopher H. Mudrick

Christopher H. Mudrick  
Vice President - Limerick Generating Station  
Exelon Generation Company, LLC

cc: S. J. Collins, Administrator Region I, USNRC  
E. M. DiPaolo, USNRC Senior Resident Inspector, LGS

<b>NRC FORM 366</b> (9-2007)	<b>U.S. NUCLEAR REGULATORY COMMISSION</b>	APPROVED BY OMB NO. 3150-0104	EXPIRES 08/31/2010
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)		Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.	

<b>1. FACILITY NAME</b> Limerick Generating Station, Unit 1	<b>2. DOCKET NUMBER</b> 05000352	<b>3. PAGE</b> 1 of 5
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**4. TITLE:**  
High Pressure Coolant Injection System Instrument Power Supply Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	02	2008	2008	003	00	12	30	2008	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> <i>(Check all that apply)</i>									
<b>10. POWER LEVEL</b>  100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A						

**12. LICENSEE CONTACT FOR THIS LER**

<b>NAME</b> Robert E. Kreider, Manager – Regulatory Assurance	<b>TELEPHONE NUMBER (Include Area Code)</b> 610-718-3400
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	BJ	JX	255N	Y					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				

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

The High Pressure Coolant Injection system was rendered inoperable due to observed oscillations in the system flow indication. The condition was corrected by recalibration of a flow transmitter, replacement of a square root converter, and replacement of a degraded inverter in the turbine control system. Failure analysis will be performed on the degraded inverter.

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		2008	-- 003	-- 00	

**NARRATIVE** (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 (OPCON) 1 (Power Operation) at approximately 100% power. There were no other structures, systems or components out of service that contributed to this event.

Description of the Event

On Sunday, November 2, 2008, at 1550 hours, a licensed operator observed frequent low-level oscillations on the high pressure coolant injection (HPCI) (EIIS:BJ) system flow indication (EIIS:FI) in the main control room. The system was not in operation at the time. As a result of the observed flow oscillations the HPCI system was declared inoperable. An investigation determined that oscillations were due to the combined effects of a flow loop square root converter and flow transmitter (EIIS:FT). Replacement of the square root converter and recalibration of the flow transmitter corrected the low-level oscillations in flow indication. HPCI was declared operable on Tuesday, November 4, 2008, at 1725 hours; however, shortly following the post maintenance turbine run, intermittent, brief momentary pulsing of several plant computer points associated with the turbine flow and speed control instrumentation were observed.

On Thursday, November 6, 2008, at 0840 hours, HPCI was declared inoperable to install recording equipment for troubleshooting to identify the cause of the intermittent momentary turbine flow and speed control instrumentation signal pulses. The troubleshooting identified that the inverter (EIIS:JX) that powers the turbine control system instruments and components was the cause of the momentary turbine flow and speed control instrumentation signal pulses. The degraded inverter was replaced and a post maintenance test was completed satisfactorily. HPCI was declared operable on Friday, November 7, 2008, at 0308 hours.

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

This event resulted in a condition that at the time of discovery could have prevented the fulfillment of the safety function of the HPCI system which is reportable per the requirements of 10CFR50.72(b)(3)(v)(D) and 10CFR50.73(a)(2)(v)(D). An 8-hour NRC ENS notification (#44623) was completed on Sunday, November 2, 2008 at 2034 hours. This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D).

Analysis of the Event

There were no actual safety consequences associated with this event. HPCI was rendered inoperable due to a degraded instrument power supply. However, the reactor core isolation cooling (RCIC) system remained operable during the event.

An inverter supplies power to the HPCI system flow instrumentation and turbine speed control system. The input to the inverter is 125 VDC and the inverter output is 120 VAC. The inverter provides the 120 VAC input for two power supplies, which output 24 VDC to the HPCI flow control loop and 48 VDC to the HPCI electronic governor module (EGM) and ramp generator signal converter (RGSC).

An investigation determined that the oscillations were due to the combined effects of a degraded flow loop square root converter and less than optimal calibration of the flow transmitter. The high zero flow signal from the flow transmitter intermittently exceeded the low flow cutoff setting on the square rooter causing the flow indication to indicate flow intermittently. This problem was independent of the intermittent, momentary tripping of DC/AC inverter.

Cause of the Event

The cause of the HPCI system inoperability was degradation of the inverter that powers the flow control loop and EGM/RGSC instrument power supplies.

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

Corrective Action Completed

The degraded inverter was replaced and the post maintenance test was successful.

Corrective Action Planned

Failure analysis will be performed on the degraded inverter.

Previous Similar Occurrences

There were two previous similar occurrences of an emergency core cooling system (ECCS) instrument power supply inverter failure that resulted in unplanned HPCI inoperability in the last three years. Unit 1 HPCI was rendered inoperable but available on October 20, 2007 following a failure of the Division 4 Trip Unit Inverter Power Supply (Ref: IR 686796 and AR A1636192). Unit 1 HPCI was also rendered inoperable but available on January 29, 2008 following a failure of the Division 2 Trip Unit Inverter Power Supply (Ref: IR 728581 and AR A1648054). The prior corrective actions for the previous events did not prevent recurrence of this inverter failure since it was not possible to identify a common cause for the failures.

Component data:

System: BJ (High Pressure Coolant Injection System)

Component: TRB (Turbine)

Component Number: 10-S211

Manufacturer: T147 Terry Steam Turbine Co

Model Number: A-3-DBC-187

Equipment: Square Root Converter

Component ID: FY-055-1K601

Manufacturer: B045 ABB Automation Inc.

Model Number: 750020AAAE1

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

Equipment: Inverter 1000VA  
 Component ID: E/S X-M1-11007  
 GE Number: E41-K603  
 Manufacturer: 255N Nuclear Logistics, Inc  
 Stock Code: 111-02282  
 Old Model Number: NLI-INV1000-125-117S  
 Old Serial number: 072001-AS-26  
 New Model Number: NLI-072034-CSI-K-5-A  
 New Serial number: 21036-001-00002