



10CFR50.73

LG-14-076
June 23, 2014

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

Limerick Generating Station, Unit 2
Facility Operating License No. NPF-85
NRC Docket No. 50-353

Subject: LER 2014-005-00, Condition Prohibited by Technical Specifications and Condition That Could Have Prevented Fulfillment of the High Pressure Coolant Injection (HPCI) System Safety Function

This Licensee Event Report (LER) addresses a condition prohibited by Technical Specifications and a condition that could have prevented fulfillment of the HPCI system safety function. A HPCI system suppression pool level transmitter was as-found inoperable during three consecutive calibration surveillance tests. The HPCI suction automatic transfer from the CST to the suppression pool on suppression pool high level remained available during this period with the exception of a four hour period when the redundant HPCI suppression pool level channel was out of service for testing. This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(D).

There are no commitments contained in this letter.

If you have any questions, please contact Robert B. Dickinson at (610) 718-3400.

Respectfully,

Original signed by

Thomas J. Dougherty
Vice President – Limerick Generating Station
Exelon Generation Company, LLC

cc: Administrator Region I, USNRC
USNRC Senior Resident Inspector, LGS

NRC FORM 366 (01-2014)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 01/31/2017								
 LICENSEE EVENT REPORT (LER) (See Page 2 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-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.												
1. FACILITY NAME Limerick Generating Station, Unit 2				2. DOCKET NUMBER 05000353		3. PAGE 1 OF 4								
4. TITLE High Pressure Coolant Injection System Inoperability Due to ECCS Actuation Instrument Channel Setpoint Drift														
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				
04	24	2014	2014	- 005	- 00	06	23	2014	FACILITY NAME	DOCKET NUMBER				
										05000				
										05000				
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)											
3			<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)		
10. POWER LEVEL 000			<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 checked="" 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														
FACILITY NAME Robert B. Dickinson, Manager - Regulatory Assurance									TELEPHONE NUMBER (Include Area Code) 610-718-3400					
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT														
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX										
B	BJ	LT	G080	Y										
14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO								15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR		
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)														
<p>One emergency core cooling system (ECCS) actuation instrumentation channel was determined to have been inoperable for a period that exceeded the Technical Specification (TS) action allowed completion time. The as-found setpoint exceeded the required limit during three consecutive 18-month calibration surveillance tests. The channel was one of two redundant high pressure coolant injection (HPCI) system suppression pool high level channels. The apparent cause of the event was a less than adequate review of the issue report that identified three setpoint drift events on a degraded HPCI level transmitter. The degraded HPCI suppression pool level transmitter was replaced. A Plant Engineering briefing was conducted to reinforce prompt and thorough evaluation of potential system operability and regulatory impacts of repetitive TS instrument recalibrations.</p>														

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
		2014	- 005	- 00	
Limerick Generating Station, Unit 2	05000353				2 OF 4

NARRATIVE**Unit Conditions Prior to the Event**

Unit 2 was in Operational Condition (OPCON) 3 (Hot Shutdown) with reactor coolant temperature at approximately 200 degrees Fahrenheit and reactor pressure at approximately zero psig. A unit shut down and cooldown for a planned maintenance outage was in progress. There were no other structures, systems or components out of service that contributed to this event.

Description of the Event

On Wednesday, February 12, 2014, Limerick Unit 2 was operating at 100% power. At 1517 hours workers obtained approval from Operations Control Room Supervisor (CRS) to start a calibration surveillance test (ST-2-055-404-2) on the division 2 high pressure coolant injection (HPCI) system (EIIS:BJ) suppression pool water level transmitter (EIIS:LT) (LT-55-2N062F). At 1719 hours, the workers informed the CRS that the test was complete with the test result being "fail/pass". The test identified that the as-found loop trip setpoint exceeded the required limit. The workers recalibrated the transmitter as directed by the test and restored the loop setpoint to within the required limits.

The workers entered this event into the corrective action program by creating an issue report which documented that during the two preceding tests the transmitter was found out of tolerance low that required the transmitter to be recalibrated during the tests. The transmitter was scheduled for replacement in January 2015.

On Thursday, April 24, 2014 at 1700 hours, Limerick Unit 2 was in Operational Condition (OPCON) 3 (Hot Shutdown), an engineer was performing an extent of condition review for the previously identified degraded HPCI suction suppression pool level transmitter. The worker initiated an issue report that recommended replacement of the transmitter during the ongoing outage. Operations entered the degraded transmitter replacement activity in the unit restart constraint log. The transmitter was replaced and tested successfully on April 27, 2014, during the in progress planned outage.

The investigation determined that there was firm evidence that the degraded level transmitter was inoperable for portions of the intervals preceding the three most recent "fail/pass" calibration tests. This conclusion is based on the as found set points and the assumption of linear degradation of the transmitter over time. The three degraded channel tests were performed on July 16, 2010, April 14, 2012, and February 12, 2014. It was also determined that the redundant channel (LT-055-2N062B) was inoperable for loop calibration for two brief periods during the last three years.

The redundant channel tests were performed on July 6, 2010, May 30, 2012 and February 12, 2014. There was one period of four hours during testing on the redundant channel when both channels were inoperable. During this period the HPCI suction automatic transfer to the

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Limerick Generating Station, Unit 2	05000353	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		2014	- 005	- 00	

NARRATIVE

suppression pool remained functional but would not have occurred within the TS allowable level.

TS 3.5.1, ECCS – Operating, requires the high pressure coolant injection system to be operable in OPCI 1 and OPCI 2 (Startup) when reactor steam dome pressure is greater than 200 psig. SR 4.5.1.c.2.b requires verifying the HPCI suction is automatically transferred from the condensate storage tank (CST) to the suppression pool on a CST low water level and on a high suppression pool water level. Therefore, HPCI was inoperable during the period when this function was inoperable.

TS 3.7.3, Reactor Core Isolation Cooling System, requires the reactor core isolation cooling (RCIC) system to be operable in OPCI 1 and OPCI 2 (Startup) when reactor steam dome pressure is greater than 150 psig. The TS action for RCIC inoperability requires HPCI to be operable and the TS action for HPCI inoperability requires RCIC to be operable. During periods when RCIC was inoperable for testing, RCIC and HPCI were inoperable concurrently; therefore, TS 3.0.3 was applicable. TS 3.0.3 requires action to be initiated within one hour to place the unit in an OPCI in which the Specification does not apply. This requirement was not met.

TS 3.3.3, Emergency Core Cooling System Actuation Instrumentation, requires the channels on Table 3.3.3-1 to be operable when applicable. HPCI actuation instruments are listed on the table including the suppression pool water level high channels. Two channels are required per trip function for the suppression pool level trip function and only one channel was operable during the periods preceding the "fail/pass" recalibrations. Table 3.3.3-1 action 35 requires placing at least one inoperable channel in the tripped condition within 24 hours or declaring the HPCI system inoperable. This requirement was not met.

TS 3.0.4 does not allow entry into an OPCI when an LCO is not met and the TS action does not permit continued operation for an unlimited period of time unless a risk assessment is performed. The risk assessment allowance does not apply to HPCI. Unit 2 entered OPCI 1 during unit startup on 5 occasions over the past 3 years. HPCI was potentially inoperable during 3 of the 5 occasions due to probable drift of the transmitter. Therefore, this TS was not complied with when Unit 2 was restarted with HPCI inoperable.

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v)(D) for a condition that could have prevented the fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident. This LER is also being submitted pursuant to the requirements 10CFR50.73(a)(2)(i)(B) for conditions prohibited by Technical Specifications.

Analysis of the Event

There was no actual safety consequence associated with this event. The potential safety consequences of this event were minimal. The HPCI suction automatic transfer from the CST to the suppression pool on suppression pool high level remained available during this period with the exception of a brief period when the redundant HPCI suppression pool level

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Limerick Generating Station, Unit 2	05000353	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2014	- 005	- 00	

NARRATIVE

channel was out of service for testing. The CST low level automatic transfer remained operable during the period when both suppression pool level channels were inoperable.

The HPCI suction automatic transfer to the suppression pool logic is comprised of two redundant suppression pool high level channels and two redundant CST low level channels arranged in one-out-of-two-once logic. An actuation of any of the four channels will initiate the HPCI suction automatic transfer from the CST suction to the suppression pool suction.

The LGS UFSAR section 7.3.1.1.1.3 states the following regarding the HPCI suction automatic realignment to the suppression pool:

The preferred source of water for the HPCI is the CST. The HPCI system will realign to suppression pool suction upon receipt of a CST low level or suppression pool high level signal. Either of these signals open the HPCI suppression pool suction valves HV-55-*F041 and F042, if closed, which in turn sends a signal to close the CST suction valve HV-55-*F004 when both are fully open.

Cause of the Event

The apparent cause of the event was a less than adequate review of the issue report that identified three setpoint drift events on a degraded HPCI suppression pool level transmitter.

Corrective Action Completed

The degraded HPCI suppression pool level transmitter was replaced.

A Plant Engineering briefing was conducted to reinforce prompt and thorough evaluation of potential system operability and regulatory impacts of repetitive TS instrument recalibrations.

Previous Similar Occurrences

There are three HPCI instrument drift events on the same degraded transmitter reported in this LER. There were no previous similar occurrences in the last three years where HPCI was determined to be inoperable in the as-found condition during the 18-month HPCI suppression pool level transmitter calibration.

Component data:

System	BJ	High Pressure Coolant Injection System
Component	LT	Transmitter, Level
Component number	LT-055-2N062F	
Manufacturer	G080 General Electric Company	
Model number	184C4775P002	
Serial number	GST41761	