



10CFR50.73

June 22, 2012

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 2011-003-01, Condition Prohibited By Technical Specifications Due To Inoperable Reactor Core Isolation Cooling System

References: LER 2011-003-00, dated July 21, 2011

This Licensee Event Report (LER) addresses an event that resulted in a condition prohibited by Technical Specifications due to an inoperable reactor core isolation cooling system and an inoperable primary containment isolation valve. The cause of the inoperability was leakage through the seat of two feedwater long path flushing valves.

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

This revision corrects an omission in the event description and analysis regarding a brief period when the high pressure coolant injection system was inoperable for testing during the period when the reactor core isolation cooling system was inoperable.

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

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

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

**LICENSEE EVENT REPORT (LER)**  
(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 FOIA/Privacy Section (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.

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**4. TITLE**  
Condition Prohibited By Technical Specifications Due To Inoperable Reactor Core Isolation Cooling System

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
05	23	2011	2011	- 003	- 01	06	22	2012	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> (Check all that apply)									
	<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)						
<b>10. POWER LEVEL</b>  100	<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 checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

**12. LICENSEE CONTACT FOR THIS LER**

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	BN	TRB	T147	Y	B	SJ	20	V085	Y

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

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

The reactor core isolation cooling system was rendered inoperable due to valve seat leakage on two feedwater long path flush motor operated valves. The valves failed to fully close when long path flushing was secured during a refueling outage. This was later detected during an investigation for a loss in main generator electrical output. The valve indicating lights indicated the valves were full closed. The cause of the event was degradation and design of the long-path recirculation valves. The corrective actions planned are valve in-body maintenance, diagnostic testing, a preventive maintenance scope revision, and long-path recirculation operating procedure revision. The valves were restored to the full closed position which restored the reactor core isolation cooling system and the primary containment isolation valve to operable. Main generator output increased to normal.

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**NARRATIVE**

Unit Conditions Prior to the Event

Unit 2 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 Monday, May 23, 2011, Limerick Unit 2 was operating at 100% power and an investigation regarding a loss of electric output was in progress. The troubleshooting plan involved performing verification that the feedwater (EIIS:SJ) long path flushing valves (EIIS:20) were full closed. During the activity the HV-041-209B valve was identified to have through seat leakage of approximately 570 gpm. The HV-041-210 valve was also identified to have through seat leakage of approximately 570 gpm since the valves are in series. When HV-041-209B and HV-041-210 were fully closed the main generator load was increased by approximately 20 MWe.

The investigation determined that the HV-041-209B and HV-041-210 valves failed to fully close when securing feedwater long path flushing during the prior refueling outage (2R11) on Thursday, April 21, 2011. Initially the HV-041-210 failed to fully close as determined by both indicating lights (red and green) illuminated (dual indication). The HV-041-209A and HV-041-209B valves were then closed to terminate long path flushing flow. It was later determined that the HV-041-209B valve was actually not fully seated even though the indicating lights were indicating full closed (green illuminated and red extinguished). The HV-041-210 was then closed until the indicating lights indicated fully closed. However, the valve was not fully seated. This resulted in a partially open flow path from the "B" feedwater header to the main condenser.

The reactor core isolation cooling (RCIC) system (EIIS:BN) is rated at 600 gpm. The RCIC injection flow path to the reactor pressure vessel (RPV) is through the "B" feedwater header. The leakage from the "B" feedwater header to the condenser was approximately 570 gpm. Therefore, RCIC was inoperable during the affected period due to potentially diverting the design flow from the reactor core. Technical Specification (TS) 3.7.3 RCIC action "a" required restoration of RCIC within 14 days. This TS action allowance was exceeded.

U.S. NUCLEAR REGULATORY COMMISSION

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The HV-041-209B valve is a primary containment isolation valve (PCIV). Since the valve was not fully seated the PCIV was inoperable during the affected period. TS 3.6.3 PCIVs action "a.1" required restoring the PCIV to operable within 4 hours. Otherwise, be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours. This TS action allowance was exceeded.

During restart from refueling outage 2R11 this event resulted in an entry into an OPERATIONAL CONDITION when a Limiting Condition for Operation was not met which is a nonconformance with TS 3.0.4.

During restart from refueling outage 2R11, planned testing rendered the high pressure coolant injection system (HPCI) (EIIS:BJ) inoperable during the period when the RCIC system was also inoperable. TS 3.5.1 ECCS - Operating, action "c.1", does not apply when RCIC is inoperable; therefore, TS 3.0.3 was applicable. TS 3.0.3 required action within one hour to place the unit in Startup within 6 hours. However, the one hour action was not met which is a nonconformance with TS 3.0.3.

Therefore, this LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(i)(B). This event is not reportable under 10CFR50.73(a)(2)(v) as an event that could have prevented the fulfillment of the HPCI safety function because the HPCI testing performed during the affected period was a planned evolution.

**Analysis of the Event**

There were no actual safety consequences associated with this event. The potential safety consequences of this event were minimal. There were no plant transients or accidents that required RCIC operation or primary containment during the affected period. High pressure coolant injection (HPCI) was inoperable during the affected period for less than seven hours during 2R11 restart testing. HPCI remained available during this period except for a period of less than one hour when test equipment was installed and removed during the test. Condensate and feedwater remained capable of injection to the RPV through the degraded feedwater header.

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The feedwater long path flush line is used during refuel outage restart to clean the condensate and feedwater lines. The flush also cleans up the hotwell until reactor water chemistry goals are achieved. The "A" and "B" feedwater headers are each equipped with a 16 inch long-path flush line near the feedwater line penetrations into primary containment. Each flush line is equipped with a 16 inch motor operated gate valve. The two flush lines merge into a single 16 inch line which returns to the main condenser. The single line is also equipped with a 16 inch motor operated gate valve.

During the refueling outage restart the indicating lights on the two affected motor operated valves indicated that the valves were fully seated. The green light was illuminated and the red light was extinguished on both valves. However, the valves were not fully seated which resulted in seat leakage back to the main condenser at a flow rate of approximately 570 gpm. The feed switches on the HV-041-209A and HV-041-209B were locked open as required prior to entering Startup Mode (OPCON 2). It is normal for a motor operated valve red indicating light to extinguish as the valve enters the seat just prior to actuation of the torque switch which terminates the valve motion. If the torque switch actuates before the valve is fully seated the red light may be extinguished with the valve slightly open.

Cause of the Event

The cause of the event was the HV-041-210 valve failed to isolate the feedwater long path recirculation line due to degradation of valve internals or stem lubrication degradation.

Corrective Action Completed

The HV-041-110 and HV-041-210 valves preventive maintenance (PM) scope was revised to include performance of diagnostic testing and an actuator PM.

The procedure (S06.5.A) for long path recirculation was revised to add steps which will ensure HV-041-109A, HV-041-109B, HV-041-209A and HV-041-209B long path flushing valves are properly closed when securing long path flushing and verified as closed prior to restart.

Corrective Action Planned

In-body maintenance and diagnostic testing will be performed on HV-041-210 during the next refueling outage (2R12) which is currently scheduled for the spring of 2013.

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**NARRATIVE**

Previous Similar Occurrences

There were no similar events involving conditions prohibited by TS for an inoperable RCIC system for the last 3 years.

Component data:

Equipment: Reactor Core Isolation Cooling System  
 Component Number: 20-S212  
 Manufacturer: T147 Terry Steam Turbine Co  
 Model Number: GS-2 TYP

Equipment: Feedwater Line Flushing PCIV  
 Component Number: HV-041-209B  
 Manufacturer: V085 Velan Valve Corp  
 Model Number: B20-07054P-02WN FIG