



10 CFR 50.73

LG-21-110

November 22, 2021

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

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

Subject: LER 2021-001-00 Unit 1 HPCI Inoperable Due to Remote Shutdown Panel Switch Failure

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(D), Limerick Generating Station hereby submits the enclosed Licensee Event Report.

There are no commitments contained in this letter.

If you have any questions, please contact Laura Lynch at (610) 718-3400.

Respectfully,

A handwritten signature in black ink, appearing to read "Frank Sturniolo".

Digitally signed by
Sturniolo, Frank
Date: 2021.11.19
09:28:28 -05'00'

Frank Sturniolo
Vice President – Limerick Generating Station
Exelon Generation Company, LLC

cc: Administrator Region I, USNRC
USNRC Senior Resident Inspector, Limerick Generating Station



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)
(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name Limerick Generating Station Unit 1	2. Docket Number 05000	3. Page 352 1 OF 3
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4. Title
Unit 1 HPCI Inoperable Due to Remote Shutdown Panel Switch Failure

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
09	23	21	2021	001	00	11	22	21		05000
									Facility Name	Docket Number
										05000

9. Operating Mode OPCON 1	10. Power Level 100
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).				

12. Licensee Contact for this LER

Licensee Contact Laura A. Lynch	Phone 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 IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
B	BJ	HS	G223	Yes					

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)			

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

During the testing of the High Pressure Coolant Injection (HPCI) System, the HPCI pump failed to obtain the Technical Specification required pressure and flow as a result of high contact resistance in the HPCI Emergency Shutdown Switch. The high resistance was attributed to mechanical switch degradation that was introduced by cycling the switch during the logic system functional Surveillance Test, which was completed 1 hour and 32 minutes prior to the HPCI Pump Valve and Flow Surveillance Test. The switch was replaced, and testing is being developed to verify the switch is functioning after the switch is operated. This event is being reported because it resulted in an unplanned inoperability of a single train safety system that could have prevented fulfillment of a safety function. An eight (8) hour ENS notification was completed on September 23, 2021 at 18:46 hours.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME Limerick Generating Station Unit 1	2. DOCKET NUMBER 05000- 352	3. LER NUMBER		
		YEAR 2021	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE

Unit Condition Prior to the Event

Unit 1 was in Operational Condition (OPCON) 1 (Power Operation) at approximately 100% power. There were no structures, systems, or components out of service that contributed to this event.

Description of the Event

On September 23, 2021, two Unit 1 High Pressure Coolant Injection (HPCI) System [BJ] testing activities were scheduled: the HPCI Logic System Functional Isolation Logic Test and the HPCI Pump Valve and Flow Test. At 09:25 the HPCI system was declared inoperable for the performance of the HPCI Logic System Functional Isolation Logic Test. At 13:09 the HPCI System was declared Operable after the completion of the test. At 14:43 the HPCI System was declared inoperable for the performance of the HPCI Pump Valve and Flow Test.

During the initial start of the turbine during the HPCI Pump Valve and Flow Test the indicated turbine speed on the plant computer point and Main Control Room tachometer was downscale. The pump flow and discharge pressure indications were used to establish an acceptable test return valve position while the speed indication issue was investigated. The test was aborted when the HPCI Pump was not able to meet the Technical Specification requirements for rated flow and discharge pressure. An eight (8) hour ENS notification was completed on September 23, 2021 at 18:46 hours.

Troubleshooting determined high contact resistance existed in the HPCI Emergency Shutdown Switch located on the Remote Shutdown Panel. The purpose of this switch is to terminate or prevent HPCI injection from the Remote Shutdown Panel under various Fire Safe Shutdown events. The HPCI Emergency Shutdown Switch is installed in the 48Vdc power supply to the HPCI EG-M module but includes additional contacts in the external wiring connections to the Woodward governor components including the flow controller demand signal to the Ramp Generator and Signal Converter (RGSC) module.

Analysis of the Event

The HPCI Emergency Shutdown Switch high resistance was attributed to mechanical switch degradation that was introduced by cycling the switch during the HPCI Logic System Functional Isolation Logic Test, which was performed 1 hour and 32 minutes prior to the HPCI Pump Valve and Flow Surveillance Test. With the unplanned loss of a single train system this condition is being reported per 10 CFR 50.73(a)(2)(v)(D), as a condition that could have prevented the fulfillment of the safety function of structures or systems required to mitigate the consequences of an accident.

Safety Consequence

There were no actual safety consequences associated with this event. The potential safety consequences of this event were minimal. The Reactor Core Isolation Cooling (RCIC), Automatic Depressurization System (ADS), Residual Heat Removal (RHR), and Core Spray (CS) systems remained operable during the period that HPCI was inoperable.

Corrective Actions Completed

The Unit 1 HPCI Emergency Shutdown Switch was replaced. A review of the completed Unit 2 testing verified the HPCI Emergency Shutdown Switch is operable.



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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Limerick Generating Station Unit 1	05000- 352	YEAR 2021	- SEQUENTIAL NUMBER 001	- REV NO. 00

NARRATIVE

Corrective Actions Planned

The Unit 2 HPCI Emergency Shutdown Switch will be proactively replaced during the next scheduled System Outage. Testing is being developed to verify the HPCI Emergency Shutdown Switch is operable after the completion of the HPCI Logic System Functional Test.

Previous Similar Occurrences

There have not been any similar occurrences of this switch failing at Limerick.

Component Data:

System: BJ High Pressure Coolant Injection
Component: HS - Handswitch
Manufacturer: G223 Grayhill Inc