



10 CFR 50.73

LG-21-001

January 12, 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 2020-001-00 Valid Automatic Actuation of the Reactor Protection System with the Reactor Critical Due to Closure of One Main Steam Isolation Valve

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv)(A), 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 that reads "Frank Sturniolo".

Digitally signed by Sturniolo,  
Frank  
Date: 2021.01.12 17:37:55 -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](mailto: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](mailto: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.

<b>1. Facility Name</b> Limerick Generating Station, Unit 1	<b>2. Docket Number</b> 05000	<b>3. Page</b> 352 1 OF 3
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**4. Title**  
Valid Automatic Actuation of the Reactor Protection System with the Reactor Critical Due to Closure of One Main Steam Isolation Valve

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
11	13	2020	2020	001	00	01	12	2021		05000
									Facility Name	Docket Number
										05000

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

<input checked="" type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" 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 checked="" 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 checked="" type="checkbox"/> 10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input 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 checked="" 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 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	SB	ISV	A585	Yes					

<b>14. Supplemental Report Expected</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	<b>15. Expected Submission Date</b>						
	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Month</th> <th>Day</th> <th>Year</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	Month	Day	Year			
Month	Day	Year					

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

A valid automatic actuation of the reactor protection system (RPS) occurred due to a high reactor pressure condition following an unexpected closure of the 1B Inboard Main Steam Isolation Valve (MSIV). The valve failed closed when a fitting installed on the instrument gas supply tubing sheared at the Primary Containment Instrument Gas (PCIG) MSIV manifold. The reactor scram was the result of a high reactor pressure condition to the unexpected closure of the 1B Inboard MSIV following the failure of PCIG tubing. The tubing failed as a result of the use of a degraded welded-in male body fitting with a new female fitting resulting in overstressing the fitting. The tubing was replaced. The station will repair or replace the connection points of this tubing to the pneumatic supply headers for all MSIVs to ensure that mating with degraded threads does not increase the risk of a vibration induced tubing failure. Additionally, a piping configuration change will be evaluated to reduce the stress on this connection.



**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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Limerick Generating Station, Unit 1	05000- 352	2020	001	00

**NARRATIVE**

**UNIT CONDITION PRIOR TO THE EVENT**

Unit 1 was in OPERATIONAL CONDITION 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 November 13, 2020 Unit 1 was operating at approximately 100 percent steady state power. At 02:44, a valid automatic actuation of the Reactor Protection System (RPS) [EIS:JC] was initiated due to a valid reactor high pressure condition. The high-pressure condition was caused by an unexpected closure of the 1B Inboard Main Steam Line Isolation Valve (MSIV). The valve failed closed when a fitting installed on the instrument gas supply tubing sheared at the Primary Containment Instrument Gas (PCIG) [EIS:LK] MSIV manifold.

The operators entered the procedure for RPV control and stabilized reactor parameters. The operators verified that all control rods were fully inserted and all safety significant systems functioned as expected. Reactor water level initially decreased to a minimum of -28 inches and increased to a maximum of +45 inches on wide range level instrumentation. The reactor water level of less than +12.5 inches resulted in an isolation signal to the closed Group IIA and Group IIB Residual Heat Removal (RHR) [EIS:BO] system valves as expected.

**CAUSE OF THE EVENT**

The reactor scram was the result of a high reactor pressure condition due to the unexpected closure of the 1B Inboard MSIV following the failure of PCIG tubing. The tubing failed as a result of high cycle fatigue that was initiated at the tube deformation and notch created by the back ferrule of a compression fitting. Degraded threads on the male connection of the tubing to the air header made the connection more vulnerable to vibration induced failure.

**CORRECTIVE ACTIONS COMPLETED**

The PCIG tubing from the header to the for all four of the Inboard MSIVs was replaced to reset the fatigue life.

**CORRECTIVE ACTIONS PLANNED**

The station will repair or replace the connection points of this tubing to the pneumatic supply headers for all MSIVs to ensure that mating with degraded threads does not increase the risk of a vibration induced tubing failure. Additionally, a piping configuration change will be evaluated to reduce the stress on this connection.

**REPORTABILITY AND SAFETY CONSEQUENCE**

A 4-hour NRC ENS notification was required by 10 CFR 50.72(b)(2)(iv)(B) for an actuation of RPS when the reactor was critical. The ENS notification (#54996) was completed on November 13, 2020 at 05:32. This event involved an automatic actuation of RPS. Therefore, this LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A).

There was no actual safety consequence associated with this event. The potential safety consequences of this event were minimal. The plant equipment performed as designed during the transient. The operators effectively stabilized reactor parameters and verified all control rods were fully inserted.

**PREVIOUS SIMILAR OCCURRENCES**

Unit 1 LER 2015-001-00

Unit 1 experienced a similar sequence of events with a reactor scram due to the unexpected closure of the 1C Inboard MSIV. The cause of the reactor scram was a failure of a PCIG fitting; however, the cause of the failure was different than the condition being reported. Unit 1 LER 2015-001-00 was caused by the use of an undersized fitting (1/4-inch fitting instead of the required 3/8-inch fitting) in a different location on the MSIV manifold.



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

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Limerick Generating Station, Unit 1	05000-	YEAR	SEQUENTIAL NUMBER	REV NO.
	352	2020	001	00

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO IRIS
B	SB	HV-041-1F022B-OP	A585	Yes