



10 CFR 50.73

LG-21-035

March 19, 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 2020-001-01 Valid Automatic Actuation of the Reactor Protection System  
with the Reactor Critical Due to Closure of One Main Steam Isolation Valve

Reference: Letter from F. Sturniolo to U.S. Nuclear Regulatory Commission "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," dated January 12,  
2021

In the above Reference, Limerick Generating Station, Unit 1 submitted a Licensee Event Report (LER), addressing a condition prohibited by Technical Specifications pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A). The enclosed LER Revision provides additional information identified during further investigation.

There are no commitments contained in this letter.

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

Respectfully,

 Digitally signed by Sturniolo,  
Frank  
Date: 2021.03.18 16:28:16 -04'00'

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/>)

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## 1. Facility Name

Limerick Generating Station, Unit 1

## 2. Docket Number

05000

352

## 3. Page

1 OF 4

## 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 -	01	03	19	2021	Facility Name	Docket Number
										05000
									Facility Name	Docket Number
										05000

## 9. Operating Mode

1

## 10. Power Level

100

## 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

## 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
D	SB	ISV	A585	Yes					

## 14. Supplemental Report Expected



No



Yes (If yes, complete 15. Expected Submission Date)

## 15. Expected Submission Date

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 due to the unexpected closure of the 1B Inboard MSIV following the failure of PCIG tubing. The failure was caused by an overstressed tubing and fitting in combination with a vibratory environment capable of driving the fitting to failure. The overstressed condition resulted from an ambiguous procedure, permitting reusing a welded-in tubing connector that had the thread repaired. The tubing was replaced and the welded-in connector will be replaced at the next opportunity. The Maintenance Procedure will be revised to remove ambiguous direction which allowed the use of the repaired fitting. A piping modification will be installed on the Inboard MSIV manifold tubing to reduce the vibration at the 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	01

**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 failure was caused by an overstressed tubing and fitting in combination with a vibratory environment capable of driving the fitting to failure. The overstress condition resulted from an ambiguous procedure, which permitted reusing a welded-in tubing connector that had the threads repaired.

**CORRECTIVE ACTIONS COMPLETED**

The PCIG tubing from the header to all four of the Inboard MSIVs was replaced to reset the fatigue life. The welded-in connector will be replaced at the next opportunity.

**CORRECTIVE ACTIONS PLANNED**

The station will revise the Maintenance Procedure to remove ambiguous direction which allowed the use of the repaired fitting. Additionally, the Inboard MSIV manifold tubing will be modified to provide additional margin to vibration-induced failures. The Outboard MSIV manifold tubing will be assessed to determine if a tubing modification is required.

**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.

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Limerick Generating Station, Unit 1	05000- 352	2020	- 001	- 01

**NARRATIVE****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.

| The 1C Inboard MSIV closure investigation concluded that the failure was related to an undersized port connector. The investigation did not take action to reduce the vibration on the manifold tubing.

