



LaSalle County Station
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10 CFR 50.73

RA19-003

January 15, 2019

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

LaSalle County Station, Unit 1
Renewed Facility Operating License No. NPF-11
NRC Docket No. 50-373

Subject: Licensee Event Report 2019-001-00, Turbine Stop Valve Limit Switch
Failure due to Lubricant Degradation

In accordance with 10 CFR 50.73(a)(2)(i)(B), Exelon Generation Company, LLC
(EGC) is submitting Licensee Event Report (LER) Number 2019-001-00 for LaSalle
County Station, Unit 1.

There are no regulatory commitments in this letter. Should you have any questions
concerning this report, please contact Ms. Dwi Murray, Regulatory Assurance Manager,
at (815) 415-2800.

Respectfully,


John Washko
Plant Manager
LaSalle County Station

Enclosure: Licensee Event Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station

**LICENSEE EVENT REPORT (LER)**

(See Page 2 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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollcts.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 LaSalle County Station, Unit 1	2. Docket Number 05000373	3. Page 1 OF 3
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4. Title
Turbine Stop Valve Limit Switch Failure due to Lubricant Degradation

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
11	16	18	2019	- 001	- 00	01	15	19	NA	NA

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
100	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<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)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER	
Licensee Contact John Van Fleet, Operations Director	Telephone Number (Include Area Code) (815) 415-2200

13. Complete One Line for each Component Failure Described in this Report															
Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES						
B	TA	33	N007	Yes	NA	NA	NA	NA	NA						
14. Supplemental Report Expected					15. Expected Submission Date										
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No					<table border="1"><tr><th>Month</th><th>Day</th><th>Year</th></tr><tr><td>NA</td><td>NA</td><td>NA</td></tr></table>					Month	Day	Year	NA	NA	NA
Month	Day	Year													
NA	NA	NA													

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

During quarterly surveillances of turbine stop valve (TSV) limit switch number 3 (1C71-N006C), the component exhibited degraded performance on May 20, 2018 and a failure on September 9, 2018. The component was replaced and sent offsite for component testing and failure analysis. The component failure analysis completed on November 16, 2018 determined the cause was attributed to degradation of the switch lubricant due to exposure from a high temperature environment, which established firm evidence that the sluggish performance exhibited in May 2018 was related to the failure in September 2018 and that a past inoperability condition existed.

The component 1C71-N006C is the TSV-3 Closure RPS channel A2 scram limit switch. This device is required by technical specifications to support LCO 3.3.1.1 function 8 (RPS) and LCO 3.3.4.1 (EOC-RPT). Each TSV position is monitored by two limit switches (for TSV-3, A2 and B1 channels). This condition results in the TSV-3 input to RPS A2 as well as one channel of the EOC-RPT trip being INOPERABLE. The appropriate LCO Conditions and Required Actions were entered and tracked. The RPS and EOC-RPT functions were maintained due to the redundant channels remaining OPERABLE. There were no reportability thresholds applicable to this issue at the time of the event, and there was no loss of safety function. The condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) for operation or condition prohibited by Technical Specifications.

Immediate corrective actions were taken to replace the component and restore the associated channel to OPERABLE. Additional actions included performance of a causal investigation, identification of a new limit switch model that has greater heat tolerance, with a component replacement schedule starting in 2019.

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

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
LaSalle County Station, Unit 1	05000373	YEAR	SEQUENTIAL NUMBER	REV NO.
		2019	- 001	- 00

NARRATIVE**PLANT AND SYSTEM IDENTIFICATION**

LaSalle County Station Unit 1 is a General Electric Boiling Water Reactor with 3546 Megawatts Thermal Rated Core Power.

The affected system was the main turbine system. The affected component was the turbine stop valve (TSV) limit switch 1C71-N006C. This is the limit switch for the TSV number 3 Closure Reactor Protection System (RPS) A2 channel.

CONDITION PRIOR TO EVENT

Unit(s): 1	Date: November 16, 2018	Time: 0000 CDT
Reactor Mode(s): 1	Mode(s) Name: Power Operation	Power Level: 100 percent

DESCRIPTION

On May 20, 2018, the limit switch on Unit 1 TSV-3 was found to be sluggish during surveillance testing. Troubleshooting performed witnessed the limit switch actuating arm failing to return to the relaxed position following movement of the TSV actuating rod assembly and the associated collar which interacts with the 1C71-N006C limit switch. After the limit switch was re-lubricated with the lubricant utilized by the manufacturer during assembly and exercised, the switch performed as required. The limit switch is normally held in the actuated position during unit operation and is only allowed to return to the relaxed, shelf state position, once per quarter.

A causal investigation was performed at the time of the May 2018 component performance issue, which recognized that historical performance issues for sluggish limit switches was due to heat-related degradation of the lubricant in the pivot area of the limit switch. Previous site experience with relubrication of sluggish limit switches had been successful in fully restoring limit switch function. It was also noted that the 1C71-N006C component had been recently replaced in February 2018. Due to the limit switch having a short in-service period (i.e., less than three months), a new infant mortality failure mechanism was suspected.

During surveillance testing performed on September 9, 2018, the switch failed to reposition or return to its shelf state. The component was replaced and sent offsite for component testing and failure analysis. The component failure analysis (documented in report dated November 16, 2018) verified the limit switch malfunction and determined the cause was attributed to degradation of the switch lubricant due to exposure from a high temperature environment, as was evidenced by dried lubrication. The testing facility also confirmed that the correct lubrication was used by the manufacturer for the component. This information established firm evidence that the sluggish limit switch operation during the May 2018 event and the September 2018 malfunction were related.

CAUSE

The failure analysis functionality testing verified the limit switch malfunction. The limit switch was sluggish and failed to return to shelf state. Based on the internal component inspections, the failure mode was attributed to:

- Degradation of the limit switch lubricant due to exposure from a high temperature environment, as evidenced by dried lubrication.
- Fretting of the cam shaft / bushing likely caused by vibration experienced in the operating environment exacerbated by the lack of lubrication.
- 20 inch-pounds CCW torque was required for switch and contact activation, which is less than the expected 27 inch-pounds of torque from Namco Operational Data.

REPORTABILITY AND SAFETY ANALYSIS

The component 1C71-N006C is the TSV-3 Closure RPS channel A2 scram limit switch. This device is required to be OPERABLE per LCO 3.3.1.1 function 8 (RPS) and LCO 3.3.4.1 (EOC-RPT). TSV-3 was fully closed during the surveillance, which should have resulted in the 1C71-N006C switch being open. Each TSV position is monitored by two limit switches (for TSV-3, A2 and B1 channels). This condition results in the TSV-3 input to RPS A2 as well as one channel of the EOC-RPT trip being INOPERABLE. The appropriate LCO Conditions and Required Actions were entered and tracked. The RPS and EOC-RPT functions were

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		YEAR	SEQUENTIAL NUMBER	REV NO.
LaSalle County Station, Unit 1	05000373	2019	- 001	- 00

NARRATIVE

maintained due to the redundant channels remaining OPERABLE. There were no reportability thresholds applicable to this issue at the time of the event, and there was no loss of safety function.

Upon receipt of the failure analysis on November 16, 2018, the station identified that a past inoperability period existed from the first occurrence of switch malfunction that occurred on May 20, 2018 until corrective action was taken in response to the surveillance test failure on September 9, 2018 based on firm evidence of the cause of the malfunction. The inoperability period was greater than allowed by TS LCO 3.3.3.1 and 3.3.4.1, as indicated below. This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TS.

- LCO 3.3.1.1 requires that the RPS instrumentation for each function is OPERABLE, and Condition A applies to one or more required channels being inoperable requires that the channel or its associated trip system is placed in trip within 12 hours. In this case, the station had exceeded the completion time of 12 hours, when the malfunctioning channel was found inoperable during September 2018 surveillance testing. In addition, LCO 3.3.1.1 Condition D was not entered for the Completion Time of Condition A not met.
- LCO 3.3.4.1 requires that the end of cycle recirculation pump trip (EOC-RPT) instrumentation is OPERABLE, which includes two channels of TSV closure and turbine control valve (TCV) fast closure or Minimum Critical Power Ratio (MCPR) limits are applied.

The events for the May 2018 and September 2018 component failures of turbine stop valve (TSV) limit switch 1C71-N006C did not meet the reporting thresholds in accordance with 10 CFR 50.72 because firm evidence did not yet exist. There were no safety consequences associated with the events since there was no loss of safety function.

CORRECTIVE ACTIONS

Corrective actions taken in response to the conditions were:

- A work order was completed to replace the component, and to restore the associated channel to OPERABLE.
- A trend investigation was performed for the aggregate of RPS TSV limit switch heat-related issues, that included disposition of the 1C71-N006C limit switch.
- Options for limit switch replacement was presented to station management, which identified the availability of a different model limit switch having higher temperature capabilities to be installed in applications starting in 2019.
- Performed component failure analysis at off-site testing facility.

The extent of this condition is the eight (four switches per unit) RPS limit switches (Namco model number EA740-80001) located within the Main Turbine Stop Valve limit switch enclosures.

PREVIOUS OCCURRENCES

Searches were performed of the LaSalle Corrective Action Program (CAP) database, operating experience records, and licensee event reports for the previous three years. No similar previous reportable events for LaSalle Station were identified for the system or failure mode. However, performance history of these limit switches has been documented in the CAP since 2004.

COMPONENT FAILURE DATA

Manufacturer: NAMCO Controls Corporation

Device: Unit 1 Turbine Stop Valve limit switch (Model: EA740-80001)

Component ID: 1C71-N006C, Unit 1 Turbine Stop Valve Position Switch (Cat. ID 0000037836)

Serial No. 1216AA423293 / 10007