Exelon Generation®

NMP1L3310
October 3, 2019

10 CFR 50.73

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

Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
Docket No. 50-220

Subject: NMP1 Licensee Event Report 2019-004, Average Power Range Monitors Declared Inoperable

In accordance with the reporting requirements contained in 10 CFR 50.73(a)(2)(v)(A), please find enclosed NMP1 Licensee Event Report (LER) 2019-004, Average Power Range Monitors Declared Inoperable.

There are no regulatory commitments contained in this letter.

Should you have any questions regarding the information in this submittal, please contact Brandon Shultz, Site Regulatory Assurance Manager, at (315) 349-7012.

Respectfully,

Todd A. Tierney

Todd A. Tierney
Plant Manager, Nine Mile Point Nuclear Station
Exelon Generation Company, LLC

TAT/RD

Enclosure: NMP1 Licensee Event Report 2019-004, Average Power Range Monitors Declared Inoperable

cc: NRC Regional Administrator, Region I
NRC Resident Inspector
NRC Project Manager

IE22
NRR

Enclosure

NMP1 Licensee Event 2019-004
Average Power Range Monitors Declared Inoperable

Nine Mile Point Nuclear Station, Unit 1

Renewed Facility Operating License No. DPR-63

NRC FORM 366 (04-2017) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

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/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Nine Mile Point Unit 1	05000220	1 OF 5

4. TITLE

Average Power Range Monitors Declared Inoperable

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
08	04	2019	2019	- 004	- 00	10	03	2019	N/A	N/A
									FACILITY NAME N/A	DOCKET NUMBER N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (*Check all that apply*)			
N	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER (*Include Area Code*)
Brandon Shultz, Site Regulatory Assurance Manager	(315) 349-7012

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	AD	SCO	GE	Y	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (*If yes, complete 15. EXPECTED SUBMISSION DATE*) ☒ NO				

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

On August 4, 2019 at 1745, Reactor Recirculation Pump #11 (RRP 11) tripped. Following the RRP trip, the Average Power Range Monitors (APRMs) flow bias trips were inoperable due to reverse flow through the RRP. The APRMs were restored to operable on August 4, 2019 at 1807 when the RRP 11 discharge blocking valve was manually closed by operations, eliminating the reverse flow condition through the pump. This event is reportable under 10 CFR 50.72(b)(3)(v)(A) and 10 CFR 50.73(a)(2)(v)(A) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition.

The cause of the RRP 11 trip is a degraded tachometer generator on the associated motor generator set. Corrective actions to prevent recurrence are to revise the preventative maintenance strategy to replace the tachometer generator every two years. The event described in this LER is documented in the plant's corrective action program.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Nine Mile Point Unit 1	05000220	2019	- 004	- 00

NARRATIVE

I. DESCRIPTION OF EVENT

A. PRE-EVENT PLANT CONDITIONS:

Prior to the event, Nine Mile Point Unit 1 (NMP1) was in the power operating condition at 100% reactor power. All five Reactor Recirculation Pumps (RRP) were in operation.

B. EVENT:

On August 4, 2019, at 17:45, NMP1 experienced a trip of RRP 11 at 100% power. At Nine Mile Point Unit 1, due to the five RRP pump design, a trip of an RRP at power will result in reverse flow through the tripped pump. This reverse flow condition results in an unconservative total flow input to the APRM logic resulting in the APRM flow biased trip set point being higher than the allowable Technical Specification value. As a result, Operations declared the APRMs inoperable.

At 18:07, Operations closed the RRP 11 discharge valve in accordance with N1-SOP-1.3 terminating the reverse flow condition. The APRMs were declared operable and Technical Specification 3.6.2a exited.

Nine Mile Point Unit 2 (NMP2) was unaffected by the RRP trip at NMP1.

Operations performed the ENS notification (#54199) required by 10 CFR 50.72(b)(3)(v)(A) and 10 CFR 50.73(a)(2)(v)(A) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition.

This event has been entered into the plant's corrective action program as IR 4269525.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

No other systems, structures, or components contributed to this event.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES AND OPERATOR ACTIONS:

The dates, times, and major occurrences and operator actions for this event are as follows.

August 4, 2019

17:43 - Computer point K311 alarm was received for Reactor Recirculation Motor Generator (RRMG) 11.

17:45 – Received annunciator F2-2-1 for "React Recirc M-G Set 11" indicating it had tripped.
17:46 – Entered N1-SOP-1.3, "Recirc Pump Trip at Power" was entered
17:46 – APRMs declared inoperable and Technical Specification 3.6.2a was entered.
18:07 – RRP 11 discharge valve is closed per N1-SOP-1.3, APRMs declared operable and Technical Specification 3.6.2a was exited.

E. METHOD OF DISCOVERY:

This event was discovered by Reactor Operators when the control room alarm was received for "React Recirc M-G Set 11".

F. SAFETY SYSTEM RESPONSES:

No operational conditions requiring the response of safety systems occurred as a result of this condition.

II. CAUSE OF EVENT:

The cause of the RRMG trip was determined to be an intermittent poor electrical connection within the tachometer generator. The most likely location would be between one of the brushes and the commutator.

III. ANALYSIS OF THE EVENT:

This event is reportable under 10 CFR 50.72(b)(3)(v)(A) and 10 CFR 50.73(a)(2)(v)(A) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition.

There were no actual nuclear safety consequences associated with the event. Although the flow-biased portion of the high neutron flux trips was not conservative, the trip function remained available. A portion of the flow-biased trip function curve is clamped at a maximum value of 122% of rated thermal power. This portion of the setpoint curve was not impacted by the non-conservative flow signal and remained available to provide the scram trip function as designed.

An assessment of the potential impact on the safety limit minimum critical power ratio (SLMCPR) was performed. This assessment included a review of thermal hydraulic stability and transients. NMP1 is analyzed for thermal-hydraulic instability using the Boiling Water Reactor Owners' Group Option II. The Option II analysis is performed to demonstrate the SLMCPR protection for postulated instability events by the APRM flow-biased flux scram setpoints. Should oscillations occur, they will be automatically detected and suppressed by

the flow-biased APRM neutron flux scram. This analysis credits the flow-biased flux scram. As such, when APRMs are declared inoperable, operators are required to use procedures in conjunction with the Exclusion and Restricted regions on the power to flow map, to protect the SLMCPR. At rated conditions during the APRM inoperable scenario, instability is not a concern barring additional reactor recirculation flow reduction and entrance into the Restricted region.

For transient review, the Recirculation Pump Trip and Stall Malfunctions are inherent power decay situations in which the core thermal transients remain within permissible limits. Transient results from tripping various combinations of recirculation pumps do not result in a scram or trip. With respect to cycle specific transient analyses performed for Anticipated Operational Occurrences (AOOs), these events terminate on a direct scram (Turbine Stop Valve Closure, Generator Load Reject, MSIV closure) and are therefore, unaffected by APRM reading. As such, if one of these events were to occur after a RRP trip and before the APRMs could be declared operable again, the SLMCPR would still be protected.

The direct cause of the APRMs being declared inoperable was the trip associated with the RRP 11. Operators were able to stabilize plant conditions quickly by properly executing the respective operating procedures and remaining in compliance with TS requirements.

It is concluded that the safety significance of this event is low, and the event did not pose a threat to the health and safety of the public or plant personnel.

This event does affect the NRC Regulatory Oversight Process Indicator for safety system function failures.

IV. CORRECTIVE ACTIONS:

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

Replacement of the tachometer generator was completed. The RRP 11 was placed back into service.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

Corrective actions to prevent recurrence are to revise the preventative maintenance strategy to replace the tachometer generator every two years.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The tachometer generator failed due to an intermittent poor electrical connection between one of the brushes and the commutator. There were no individual component failures.

B. PREVIOUS LERs ON SIMILAR EVENTS:

LER 2014-001 was submitted acknowledging the failure to report two separate occasions in 2011 and 2012 in which RRP trips led to the inoperability of APRMs. The actions taken as a result of LER 2014-001 regarding the missed reportability, led to the correct determination in this report.

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 FUNCTION IDENTIFIER	IEEE 805 SYSTEM IDENTIFICATION
Average Power Range Monitor (APRM)	JIC	JC
Reactor Recirculation Pumps	P	AD