Exelon Generation.

10 CFR 50.73

NMP1L3184
November 2, 2017

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. NPF-63
Docket No. 50-220

Subject: NMP1 Licensee Event Report 2017-003, Automatic Reactor Scram due to Low Reactor Water Level

In accordance with the reporting requirements contained in 10 CFR 50.73(a)(2)(iv)(A), please find enclosed NMP1 Licensee Event Report (LER) 2017-003, Automatic Reactor Scram due to Low Reactor Water Level.

There are no regulatory commitments contained in this letter.

Should you have any questions regarding the information in this submittal, please contact Dennis M. Moore, Site Regulatory Assurance Manager, at (315) 349-5219.

Respectfully,

Robert E. Kreider Jr.
Plant Manager, Nine Mile Point Nuclear Station
Exelon Generation Company, LLC

REK/RSP

Enclosure: NMP1 Licensee Event Report 2017-003, Automatic Reactor Scram due to Low Reactor Water Level

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

IE22
NRR

Enclosure

NMP2 Licensee Event Report 2017-001,

Automatic Reactor Scram due to High Reactor Pressure

Nine Mile Point Nuclear Station, Unit 2

Renewed Facility Operating License No. NPF-69

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

Automatic Reactor Scram due to Reactor Vessel Low Water Level

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 N/A	DOCKET NUMBER N/A
09	06	2017	2017	- 003	- 00	11	2	2017	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)*			
RUN	☐ 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)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
100	☐ 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)*
Dennis M. Moore, Site Regulatory Assurance Manager	(315) 349-5219

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	JB	AMP	Curtis-Wright	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 September 6, 2017 at 1157, Nine Mile Point Unit 1 experienced an automatic reactor scram due to reactor vessel low water level. The automatic Reactor Protection System (RPS) actuation and reactor scram is reportable per 10 CFR 50.72 (b)(2)(iv)(B) and 10 CFR 50.73(a)(2)(iv)(A) as any event or condition that resulted in a manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B). Following the automatic scram all plant systems responded per design including High Pressure Coolant Injection (HPCI) System automatic initiation. HPCI is a flow control mode of the normal feedwater systems, and is not an Emergency Core Cooling System.

The root cause of the scram was a failed power supply within the Proportional Amplifier, PAM-ID23E. This power supply failure resulted in the output from the module dropping out causing the #13 Feedwater Pump Flow Control Valve to close. The corrective action taken was the replacement of the failed Feedwater Level Control module, PAM-ID23E.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER YEAR	SEQUENTIAL NUMBER	REV NO.
Nine Mile Point Unit 1	05000220	2017	- 003	- 00

NARRATIVE

I. DESCRIPTION OF EVENT

A. PRE-EVENT PLANT CONDITIONS:

Prior to the event, Nine Mile Point Unit 1 (NMP1) was in Run and operating at 100% reactor power.

B. EVENT:

On 9/6/2017, at approximately 11:57, NMP1 experienced a reactor scram due to reactor water low level. Following the scram Unit 1 also experienced a low-low reactor water level condition causing automatic Reactor Pressure Vessel (RPV) and containment isolation. Significant automatic responses that occur due to low-low reactor water level conditions include Main Steam Isolation Valve (MSIV) isolation, Reactor Water Clean Up (RWCU) isolation, core spray initiation signal, reactor recirculation pump trip, and emergency condenser vent and drain valve isolation.

The HPCI mode of feed water first initiated on the reactor water low level signal. Following this HPCI initiation, vessel level continued to lower until low-low level was received. Due to the scram, trip of recirculation pumps, and HPCI initiation, vessel level rose to greater than 85" requiring Reactor Operators to perform procedurally driven actions for securing the feed water pumps.

Additionally, following MSIV isolation on low-low level, vessel pressure control was established on the emergency condenser system briefly by manually placing the 11 emergency condenser in service. This resulted in an expected rise in vessel level. Approximately five minutes after placing the 11 emergency condenser in service Reactor Operations reopened MSIVs, transferred pressure control from the 11 emergency condenser to the turbine bypass valves, and removed 11 emergency condenser from service.

Following the restoration of RWCU, opening of the MSIVs, and recovery of RPV water level, the HPCI mode of feed water was reset and feed water level control was transferred to the manual mode.

Troubleshooting following the scram identified a failed power supply within Proportional Amplifier PAM-ID23E which caused the Flow Control Valve for #13 Feedwater Pump to close.

The module was sent for failure analysis. During this analysis, it was identified that a Schottky diode internal to the power supply of the Proportional Amplifier had failed, resulting in the output from the module to drop out.

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

Operations performed the ENS notification (#52950) required by 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A) for the manual reactor scram and specified system activations.

This event has been entered into the plant's corrective action program as IR 4049445.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Nine Mile Point Unit 1	05000220	2017	- 003	- 00

NARRATIVE

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.

September 6, 2017

1156:57	—Computer Point K331, FW CNTR SF/FF ERROR SIG received on the PPC alarm typer
1157	—13 Feedwater Flow Control Valve rapidly closes
1157	—Annunciator F2-3-3, REACT VESSEL LEVEL HI-LO received for low RPV level
1157:15	—Reactor automatically scrams on low RPV level, HPCI initiation signal received
1157:21	—11 and 12 Feedwater Pumps start in HPCI mode
1157:34	—Lo-Lo Vessel Level reached, vessel and containment isolation signals received
1157:34	—All Reactor Recirculation Pumps trip
1157:34	—Reactor Water Cleanup isolates
1157:35	—Core Spray auto start signal
1157:35	—All MSIVs shut
1157:35	—Lo-Lo isolation signal clear
1158	—Reactor Operator executes N1-SOP-1 level control actions, secures both Feedwater Pumps due to high RPV level
1158:45	—11 Emergency Condenser placed into service for RPV pressure control
1203:31	—MSIVs reopened, Main Condenser re-established for RPV pressure control
1204:14	—11 Emergency Condenser removed from service
1217	—Core Spray is secured

E. METHOD OF DISCOVERY:

This event was discovered by Reactor Operators when the 13 Feedwater Flow Control Valve began to rapidly close and Reactor Vessel Level Hi-LO Alarm was received for low RPV level.

F. SAFETY SYSTEM RESPONSES:

All safety systems responded per design.

NARRATIVE

II. CAUSE OF EVENT:

The cause of the scram was due to a failed power supply within the Proportional Amplifier, PAM-ID23E. This power supply failure was determined to be due to a Schottky diode internal to the power supply of the Proportional Amplifier which resulted in the output from the module dropping out causing the #13 Feedwater Pump Flow Control Valve to close.

III. ANALYSIS OF THE EVENT:

The automatic reactor scram is reportable under 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.73(a)(2)(iv)(A). It is defined under paragraph 10 CFR 50.73(a)(2)(iv)(A) as any event or condition that resulted in manual or automatic action of any of the specified systems listed in 10 CFR 50.73(a)(2)(iv)(B).

The equipment failure associated with this event is a power supply within the Proportional Amplifier, PAM-ID23E. This power supply failure was determined to be due to a Schottky diode internal to the power supply of the Proportional Amplifier which resulted in the output from the module dropping out causing the #13 Feedwater Pump Flow Control Valve to drive closed. All other plant systems performed per design. Plant parameters, other than the RPV water level, remained within normal values throughout the event. There was no loss of offsite power to the onsite emergency buses, both trains of The HPCI mode of feed and condensate system initiated as designed, and the core spray initiation signal was received but injection was not required.

Based on the above discussion, 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.

After review and following the guidance contained within NEI 99-02 it was determined that this event did not require additional operator actions beyond that of a "normal" scram. The scram did not involve the unavailability of or inability to recover main feedwater nor did it involve the lifting of electromagnetic relief valves for pressure control. This event did not present additional challenges to plant operations staff and does not meet the criteria required to be classified as a complicated scram.

This event does affect the NRC Regulatory Oversight Process Indicator for unplanned scrams per 7000 hours of critical operation.

IV. CORRECTIVE ACTIONS:

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

Replaced failed Feedwater Level Control module PAM-ID23E.

NARRATIVE

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

To prevent recurrence, a corrective design change is scheduled for 2019 which will implement and utilize fault tolerant digital controllers for the feedwater flow control valves.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The root cause was a failed power supply within the Proportional Amplifier, PAM-ID23E. This power supply failure was determined to be due to a Schottky diode internal to the power supply of the Proportional Amplifier which resulted in the output from the module dropping out causing the #13 Feedwater Pump Flow Control Valve to drive closed. This failure was premature as the power supply was new as of March 2017.

B. PREVIOUS LERs ON SIMILAR EVENTS:

LER 2012-005 – In 2012 a scram occurred due to a pair of failed transistors internal to the flow error proportional amplifier. The cause of this failure was in a new power supply and the actions from 2012 would not have prevented this event

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
Main Steam Isolation Valve	ISV	SB
Proportional Amplifier	AMP	JB
Reactor Pressure Vessel	RPV	AD
Feedwater Level Control System	N/A	JB
High Pressure Coolant Injection System	N/A	BJ
Feedwater System	N/A	SJ
Reactor Water Clean Up System	N/A	CE
Reactor Protection System	N/A	SC
Containment Isolation System	N/A	JM
Emergency Condenser System	N/A	BL
Core spray system	N/A	BG

D. SPECIAL COMMENTS:
None