



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
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February 13, 2018

Mr. Bryan C. Hanson  
Senior Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: NINE MILE POINT NUCLEAR STATION – INTEGRATED INSPECTION  
REPORT 05000220/2017004 AND 05000410/2017004

Dear Mr. Hanson:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Nine Mile Point Nuclear Station, LLC (NMPNS), Units 1 and 2. On January 24, 2018, the NRC inspectors discussed the results of this inspection with Mr. Peter Orphanos, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. Three of these findings involved violations of NRC requirements. Further, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at NMPNS. In addition, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator, Region I, and the NRC Resident Inspector at NMPNS.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Michelle P. Catts, Acting Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Docket Nos. 50-220 and 50-410  
License Nos. DPR-63 and NPF-69

Enclosure:  
Inspection Report 05000220/2017004 and 05000410/2017004  
w/Attachment: Supplementary Information

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SUBJECT: NINE MILE POINT NUCLEAR STATION – INTEGRATED INSPECTION  
REPORT 05000220/2017004 AND 05000410/2017004 DATED  
FEBRUARY 13, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION****REGION I**

Docket Nos. 50-220 and 50-410

License Nos. DPR-63 and NPF-69

Report Nos. 05000220/2017004 and 05000410/2017004

Licensee: Exelon Generation Company, LLC (Exelon)

Facility: Nine Mile Point Nuclear Station, LLC (NMPNS)  
Units 1 and 2

Location: Oswego, New York

Dates: October 1, 2017, through December 31, 2017

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Approved by: Michelle P. Catts, Acting Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Report 05000220/2017004 and 05000410/2017004; 10/01/2017 – 12/31/2017; NMPNS, Units 1 and 2; Maintenance Effectiveness, Operability Determinations and Functionality Assessments, and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified three non-cited violations (NCVs) and one finding not associated with a regulatory requirement (FIN), all of which were of very low safety significance (Green and/or Severity Level IV). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Cornerstone: Initiating Events

- Green. The inspectors documented a self-revealing Green finding (FIN) of CNG-CA-1.01-1000, "Corrective Action Program," Revision 01100, because Nine Mile Point Nuclear Station (NMPNS) failed to implement corrective actions at NMPNS Unit 2 to remove and replace all un-annealed red brass piping for the instrument air system during the April 2008 refueling outage. Specifically, on July 13, 2017, Unit 2 experienced a rupture of un-annealed red brass instrument air pipe which resulted in a feedwater pump trip and a reactor recirculation pump runback to 49 percent. Exelon's corrective actions for the July 13, 2017 failure of un-annealed red brass instrument air piping included wrapping the instrument air piping with a material that both supports the piping and prevents potential stress corrosion cracking. Exelon has developed work orders to replace the piping in the upcoming outage in spring 2018. Exelon also improved staff training for accountability and work checking to verify that generated work orders are completed and closed out. Exelon entered this issue into the corrective action program (CAP) as issue report (IR) 04031685, and performed a corrective action program evaluation (CAPE).

This finding is more than minor because it is associated with the design control attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, NMPNS staff failed to complete corrective actions to replace Unit 2 un-annealed red brass instrument air piping, which was susceptible to stress corrosion cracking, resulting in a feedwater pump trip and a reactor recirculation runback to 49 percent on July 13, 2017. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on October 7, 2016, and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012. The inspectors determined that the finding was of very low safety significance (Green) because it did not result in the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and affected mitigation equipment. The inspectors determined that this finding did not have a cross-cutting aspect because the performance deficiency occurred greater than 3 years ago; therefore, it is not considered to be indicative of current plant performance. (Section 40A2.4)

## Cornerstone: Mitigating Systems

- Green. An NRC-identified Green non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65 (a)(2), was identified because Exelon did not adequately demonstrate that the performance of the Unit 1 main control room (MCR) annunciators was effectively controlled through performance of appropriate preventive maintenance. Specifically, Exelon did not identify and properly account for functional failures of the MCR annunciators in June 2017, and therefore did not recognize that the annunciator system exceeded its performance criteria and required a Maintenance Rule (a)(1) evaluation. On December 7, 2017, Exelon entered the issue into their CAP as IR 04081698 and performed a review of the events identified by the inspectors that were applicable to the maintenance rule annunciator system. Corrective actions included Exelon determining that the events were functional failures, and initiated an (a)(1) evaluation based on the MCR annunciator system functional failures exceeding the designated performance criteria of an allowable one functional failure per 24 months.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, following the two failures of the main control annunciator panel in June 2017, Exelon did not identify the failures as functional failures, and consequently, did not establish goals and monitoring criteria in accordance with 10 CFR 50.65(a)(1). In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating structure, system, or component (SSC), did not represent a loss of system and/or function, did not involve an actual loss of a function of at least a single train or two separate safety systems for a greater time than allowed by technical specifications (TS), and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program. This finding has a cross-cutting aspect in the area of Human Performance, Consistent Process, in that Exelon failed to use a consistent, systematic approach to make decisions. Specifically, Exelon did not ensure their review process for issues entered into the CAP was effectively implemented to ensure proper evaluations for all applicable maintenance rule systems affected by an SSC failure. [H.13] (Section 1R12.b.1)

- Green. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when Exelon failed to perform an adequate operability determination in accordance with OP-AA-108-115, "Operability Determinations," Revision 20, upon identification of Unit 2 degraded internal flood barriers that support operability of emergency core cooling system (ECCS) equipment. Specifically, from November 21 until December 10, 2017, Exelon failed to properly evaluate the excavation of internal flood barriers and concluded there was a reasonable expectation for operability of the supported ECCS systems. Exelon entered this issue into the CAP as IR 04082686. Corrective actions included conducting a detailed evaluation of operability for the supported safety-related systems, additional training associated with TS 3.0.9, including a focus on the need for risk assessments when entering TS 3.0.9, and a procedure change to CC-AA-201, "Plant Barrier Control Program," and CC-NM-201-1001, "Plant Barrier

Control Program Implementation,” which is the NMPNS specific procedure to address the vulnerabilities associated with impairing multiple required barriers.

This finding is more than minor because it is associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, from November 21 until December 10, 2017, Exelon failed to adequately evaluate the operability of a degraded internal flooding barrier and the potential impact on operability of the supported ECCS system equipment. The inspectors identified that the internal flood barrier was excavated such that there was not sufficient material to ensure adequate flood protection, and resulted in a reasonable doubt for the operability of the supported ECCS systems. This finding is also similar to example 3.j and 3.k of IMC 0612 Appendix E, “Examples of Minor Issues,” issued August 11, 2009, because the condition identified by the inspectors resulted in a reasonable doubt for the operability of the ECCS supported systems and additional analysis was necessary to verify operability. In accordance with IMC 0609.04, “Initial Characterization of Findings,” and Exhibit 2 of IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green), because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to vulnerability to external initiating events. This finding has a cross-cutting aspect in the area of Human Performance, Work Management, because Exelon failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. As a result, Exelon personnel failed to recognize that work activities that impaired internal flood barriers on both Division I and II low pressure ECCS pump rooms were executed simultaneously, which led to an unplanned entry into TS Limiting Condition for Operation (LCO) 3.0.9. [H.5] (Section 1R15)

### **Cornerstone: Barrier Integrity**

- Green. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified for Exelon’s failure to ensure that activities affecting quality were prescribed in a manner appropriate to the circumstances for the Unit 1 control room chiller system. Specifically, Exelon procedure N1-OP-49, “Control Room Ventilation System,” Revision 03800, Section H.5, “Venting of Control Room Chiller Circulating Water Pump 11 and 12 Discharge Piping,” led personnel to inadequately fill and vent the 12 control room chiller during system restoration from maintenance, while in a single chiller lineup. As a result, on October 15, 2017, control room chiller 12 tripped on low flow, and due to a prior trip of 11A control room chiller compressor, an unplanned 7-day LCO in accordance with TS 3.4.5.e, “Control Room Air Treatment System,” was entered due to an insufficient number of available chiller compressors to provide adequate control room cooling. Exelon entered this issue into the CAP as IR 04090200. Corrective actions included generating a procedure change to correct N1-OP-49 Section H.5, which provides instruction for filling and venting when in a single chiller lineup.

This finding is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, Exelon failed to prescribe an adequate fill and vent procedure for the Unit 1 control room chillers which led to a trip of the 12 chiller on low flow while troubleshooting of chiller compressor 11A was on-going,



resulting in an unplanned TS LCO entry. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The performance deficiency did not represent a degradation of the radiological barrier function provided for the control room. Additionally, the performance deficiency did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere. Therefore, this finding was determined to be of very low safety significance (Green). This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because between 2014 and 2017 the inspectors noted over 20 issue reports documenting issues affecting reliability of the control room chiller system. Exelon failed to thoroughly evaluate the issues associated with the chillers to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, Exelon failed to effectively evaluate previous chiller trips and to prevent additional trips of the chiller system such as the one that occurred on October 15, 2017. [P.2] (Section 1R12.b.2)

### **Other Findings**

A violation of very low safety significance that was identified by Exelon was reviewed by the inspectors. Corrective actions taken or planned by Exelon have been entered into Exelon's CAP. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On November 18, 2017, operators reduced power to approximately 17 percent to perform a containment entry to investigate the source of increased containment unidentified leakage. Following containment entry, on November 19, operators restored reactor power to 100 percent. Unit 1 remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On November 16, 2017, operators reduced power to 75 percent to perform turbine valve testing and a control rod sequence exchange. On November 17, operators restored power to 100 percent. Unit 2 remained at or near 100 percent for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal cold temperatures. The review focused on the Unit 1 and Unit 2 115kV offsite power sources on October 30, 2017. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

#### .1 Partial System Walkdowns (71111.04 – 3 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2 'B' residual heat removal (RHR) system during planned maintenance on the 'A' RHR heat exchanger bypass valve on October 18, 2017

- Unit 1 12 emergency service water (ESW) system during planned maintenance on the 11 ESW pump and breaker on October 26, 2017
- Unit 2 reactor core isolation cooling system following planned maintenance on November 13, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), IRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Exelon staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On November 8, 2017, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 high pressure core spray (HPCS) system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies.

Additionally, the inspectors reviewed a sample of related issue reports and WOs to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire ProtectionResident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Exelon controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1 turbine building (TB) 277' east battery room, fire area (FA) 17A on October 17, 2017
- Unit 1 TB 277' west battery room, FA 17B on October 17, 2017
- Unit 1 TB 261' emergency diesel generator (EDG) 103 room, FA 19 on October 17, 2017
- Unit 1 TB 261' EDG 102 room, FA 22 on October 17, 2017
- Unit 1 TB 261' EDG 102 powerboard room, FA 23 on October 17, 2017

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – 1 sample)a. Inspection Scope

The inspectors reviewed the EDG 102 jacket water heat exchanger readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13, "Service Water System Requirements Affecting Safety-Related Equipment." The inspectors observed actual performance tests for the heat exchanger and/or reviewed the results of previous inspections of the EDG 102 jacket water and similar heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance

.1 Quarterly Review of Licensed Operator Regualification Testing and Training  
(71111.11Q - 2 samples)

a. Inspection Scope

The inspectors observed:

- Unit 1 simulator scenario that involved the overspeed of a reactor recirculation pump, the loss of a 4 kV (kilovolt) safety-related electrical bus, and a loss of coolant accident with a failure of the reactor to scram on November 1, 2017
- Unit 2 simulator scenario that involved the trip of a control rod drive pump, a trip of an instrument air system cooling pump, a feedwater heating transient, and a loss of coolant accident in secondary containment with a failure to scram on November 1, 2017

The inspectors evaluated operator performance during the simulated events and verified completion of risk-significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the unit supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the TS action statements entered by the unit supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room  
(71111.11Q - 2 samples)

a. Inspection Scope

The inspectors observed:

- Unit 1 during a reactor power reduction to conduct a containment entry to identify the source of increasing unidentified drywell floor drain leak rate on November 18, 2017
- Unit 2 during reduced power operations for turbine stop valve and turbine control valve reactor protection system surveillance testing and during a control rod sequence exchange on November 16 and 17, 2017

The inspectors reviewed HU-AA-101, "Human Performance Tools and Verification Practices," Revision 009, and observed test performance to verify that procedure use, crew communications, and coordination of plant activities among work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

.3 Licensed Operator Regualification (71111.11A – 2 samples)

a. Inspection Scope

On December 27, 2017, an in-office review of results of the Unit 1 annual operating tests and the Unit 2 annual operating tests and biennial written exams was conducted.

Examination Results

Unit 1 and Unit 2 requalification exam results for 2017 were reviewed to determine if pass/fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and NRC IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

Unit 1 (operating tests only)

- Zero out of 49 operators failed at least one section of the exam. The overall individual failure rate was 0.0 percent.
- Zero out of six crews failed the simulator test. The crew failure rate was 0.0 percent.

Unit 2 (operating tests and biennial written exams)

- One out of 46 operators failed at least one section of the exam. The overall individual failure rate was 2.2 percent.
- Zero out of six crews failed the simulator test. The crew failure rate was 0.0 percent.

b. Findings

No findings were identified.

.4 Licensed Operator Regualification (71111.11B – 1 sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program and Licensed Operator Performance."

Written Examination Quality

The inspectors reviewed two Unit 2 written examinations (reactor operator and senior reactor operator) administered during the 2017 examination cycle for qualitative and

quantitative attributes as specified in Appendix B of Attachment 71111.11, "Licensed Operator Requalification."

#### Operating Test Quality

For Unit 2, 12 job performance measures (JPMs) and six scenarios were reviewed for qualitative and quantitative attributes as specified in Appendix C of 71111.11, "Licensed Operator Requalification Program."

#### Licensee Administration of Operating Tests

Observations were made of the Unit 2 dynamic simulator exams and JPMs administered during the week of October 16, 2017. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of JPMs.

#### Examination Security

The inspectors assessed whether facility staff properly safeguarded exam material. The JPMs, scenarios, and written examinations were checked for excessive overlap of test items.

#### Remedial Training and Re-Examinations

A remediation plan and examination were reviewed to assess the effectiveness of the remedial training.

#### Conformance with Operator License Conditions

Medical records for eight licensed operators from Unit 2 were reviewed to assess conformance with license conditions. All records reviewed were satisfactory.

Proficiency watch standing records for Unit 2 licensed operators were reviewed for the first three quarters of 2017. All active licensed operators met the watch standing requirements to maintain an active license.

The reactivation plan for a Unit 2 licensed operator was reviewed to assess the effectiveness of the reactivation process. The reactivation was successfully processed in accordance with site procedures.

Records for the participation of Unit 2 licensed operators in the requalification program from January 2016 through September 2017 were reviewed. Records for the performance of licensed operators on annual requalification operating test exams results were reviewed for 2016.

#### Simulator Performance

The Unit 2 simulator performance and fidelity was reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was reviewed to ensure facility staff addressed identified modeling problems. Simulator test documentation was also reviewed.

### Problem Identification and Resolution

A review was conducted of recent Unit 2 operating history documentation found in inspection reports, Exelon's CAP, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from Exelon's CAP which indicated possible training deficiencies, to verify that they had been appropriately addressed. The senior resident inspector was also consulted for insights regarding licensed operators' performances. These reviews did not detect any operational events that were indicative of possible training deficiencies.

#### b. Findings

No findings were identified.

### 1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

#### a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Exelon staff were reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Exelon staff were identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Unit 1 MCR annunciators on October 18, 2017
- Unit 1 control room emergency ventilation system following failure of multiple chiller compressors on October 19, 2017
- Unit 1 radwaste liquid discharge radiation monitor on October 26, 2017

#### b.1 Findings

Introduction. An NRC-identified Green NCV of 10 CFR 50.65 (a)(2), was identified because Exelon did not adequately demonstrate that the performance of the Unit 1 MCR annunciators was effectively controlled through performance of appropriate preventive maintenance. Specifically, Exelon did not identify and properly account for functional failures of the MCR annunciators in June 2017, and therefore did not recognize that the annunciator system exceeded its performance criteria and required a Maintenance Rule (a)(1) evaluation.

Description. Inspectors identified two functional failures of the Unit 1 MCR annunciator system that were not identified by Exelon:

- On June 8, 2017, while performing N1-ISP-201-047, "Containment Atmosphere H2 and O2 Monitors Instrument Channel Test and Calibration," Revision 00600,



annunciators L4-4-3, "Containment Monitor System 12 Hydrogen Level HI" and L4-4-4, "Containment Monitor System 12 Oxygen Level HI," failed to provide a visual or audible alarm. The annunciators were repaired and Exelon entered the issue into the CAP as IR 04020205.

- On June 23, 2017, while performing N1-IPM-104-001, "Reactor Building Floor/Equipment Drain Sump Level and Wall Mounted Level Switch Instrument Calibration," Revision 00700, annunciator H2-2-1, "R BLDG FL DR SUMPS 11-16 AREA WTR LVL LEVEL HIGH," failed to provide an audible or visual alarm when the sump level increased to within an inch of the top of the sump. The sump level switch was replaced and Exelon entered the issue into the CAP as IR 04025046.

As stated in ER-AA-310, "Implementation of the Maintenance Rule," Revision 11, monitoring must be performed in a manner to support a timely (a)(1) evaluation. Section 4.5.4 also requires when an SSC exceeds the performance criteria that an IR be generated to document the (a)(1) classification determination. Inspectors identified on December 7, 2017, that contrary to the requirements of ER-AA-310, Exelon failed to evaluate the events that impacted the annunciator system. On December 7, 2017, Exelon initiated IR 04081698 to perform a review of the events identified by the inspectors that were applicable to the maintenance rule annunciator system. Exelon determined that the events were functional failures, and initiated an (a)(1) evaluation based on the MCR annunciator system functional failures exceeding the designated performance criteria of an allowable one functional failure per 24 months.

Analysis. The inspectors determined that Exelon's failure to identify the June 8, 2017, and June 23, 2017, MCR annunciator failures as functional failures, and as a result, failure to perform an evaluation of the system under 50.65(a)(1) to specify goals, corrective actions, and monitoring was a performance deficiency within Exelon's ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, following the two failures of main control room annunciators in June 2017, Exelon did not identify the failures as functional failures, and consequently, did not establish goals and monitoring criteria in accordance with 10 CFR 50.65(a)(1).

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The SDP for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, represent a loss of system and/or function, involve an actual loss of a function of at least a single train or two separate safety systems for a greater time than allowed by technical specifications (TS), or represent an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program.

This finding has a cross-cutting aspect in the area of Human Performance, Consistent Process in that Exelon failed to use a consistent, systematic approach to make decisions. Specifically, Exelon did not ensure their review process for issues entered into the CAP was effectively implemented to ensure proper evaluations for all applicable maintenance rule systems affected by a structure, system, or component failure. [H.13]

Enforcement. Title 10 CFR 50.65(a)(1) requires, in part, that holders of an operating license shall monitor the performance or condition of SSCs within the scope of the monitoring program as defined in 10 CFR 50.65(b) against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions.

Title 10 CFR 50.65 (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, from June 23 until December 7, 2017, Exelon failed to demonstrate that performance of the MCR annunciator system (a SSC within the scope of the maintenance rule) was being effectively controlled through the performance of appropriate preventive maintenance in that repetitive maintenance functional failures of MCR annunciators, which occurred on June 8 and June 23, 2017, exceeded established performance criteria for the SSC. Following the failures, the licensee failed to consider placing the MCR annunciator system under 10 CFR 50.65(a)(1) for establishing goals and monitoring against the goals. Because this issue is of very low safety significance (Green) and Exelon entered this issue into their CAP as IR 04081698, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000220/2017004-01: Main Control Room Annunciators 10 CFR 50.65(a)(2) Determination Not Met)**

## b.2 Findings

Introduction. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for Exelon's failure to ensure that activities affecting quality were prescribed in a manner appropriate to the circumstances for the Unit 1 control room chiller system. Specifically, use of Exelon procedure N1-OP-49, "Control Room Ventilation System," Revision 03800, Section H.5, "Venting of Control Room Chiller Circulating Water Pump 11 and 12 Discharge Piping," led personnel to inadequately fill and vent the 12 control room chiller during system restoration from maintenance, while in a single chiller lineup. As a result, on October 15, 2017, control room chiller 12 tripped on low flow, and due to a prior trip of 11A control room chiller compressor, an unplanned 7 day LCO in accordance with TS 3.4.5.e, "Control Room Air Treatment System," was entered, due to an insufficient number of available chiller compressors to provide adequate control room cooling.

Description. The Unit 1 Control Room Emergency Ventilation System (CREVS) provides filtration, pressurization, heating, and cooling to the control complex, which includes the control room, auxiliary control room, and the instrument shop. The system is designed to provide a habitable environment within the control complex during all modes of operation. The system also includes an emergency function that provides filtered,

recirculated air for heating and cooling during abnormal operations. Cooling is provided by two redundant cooling coils which are cooled by the control room chilled water system in the 11 and 12 control room chillers. Each chiller is equipped with two compressors, 11A, 11B, 12A, and 12B. Control Room Air Treatment is considered operable when Control Room temperature and Auxiliary Control Room temperature are below 80.5°F and 77°F respectively. Additionally, two compressors are required to be available to provide cooling in accordance with the design basis and to consider the CREVS system operable.

Between 2014 and 2017 the inspectors noted over 20 IRs documenting issues affecting reliability of the control room chiller system; which included high motor winding temperature of the compressor motors, loss of oil to the compressor motors, loss of refrigerant, and low chilled water flow. During day shift on October 11, 2017, the control room chillers were placed in a single chiller lineup, with control room chiller 12 in-service. Exelon staff performed a fill and vent due to previous maintenance performed on October 5 that was conducted on the 12 control room chiller system to replace pressure control valve (PCV)-210.1-29, the regulator for chilled water makeup from reactor building closed loop cooling to control room chilled water. On October 11, 2017, control room chiller compressor 11A experienced a trip due to high motor winding temperature. Exelon entered the issue into the CAP as IR 04061975, and began troubleshooting the 11A compressor with vendor assistance.

On October 15, 2017, operators identified a rising trend of main control room ambient temperature. Operators dispatched to the CREVS system discovered that both 12 control room chiller compressors had tripped due to low flow. With control room chiller compressor 11A still out of service for troubleshooting, and both 12 control room chiller compressors tripped, operators entered an unplanned 7 day LCO in accordance with TS 3.4.5.e, "Control Room Air Treatment System."

Operators had used N1-OP-49 to conduct the 12 chiller fill and vent. However, the procedure was not written to ensure an adequate fill and vent in the single chiller system configuration or for the maintenance activity being performed and contained no prerequisites, precautions, or notes alerting the operators that alternate isolations may be required. In this case, due to the location of the PCV which was replaced, alternate isolation points both upstream and downstream needed to be used in order to fully vent the system. As a result, the system was not adequately vented, and the compressors tripped shortly after the system line up was restored following the maintenance. Exelon's initial troubleshooting suspected a faulty flow switch; however, inspector interviews resulted in the discovery of the procedure being inadequate to perform the fill and vent using N1-OP-49 for single chiller lineup with the tagout used to support the planned maintenance.

Exelon generated IR 04090200 to document the vulnerability in the system restoration instruction using N1-OP-49, while in single chiller lineup. Exelon's corrective actions included generating a procedure change to correct N1-OP-49 Section H.5, which provides instruction for filling and venting when in a single chiller lineup.

Analysis. The inspectors determined that Exelon's failure to provide a procedure to adequately fill and vent the control room chiller system following planned maintenance was a performance deficiency that was reasonably within Exelon's ability to foresee and prevent. This finding is more than minor because it is associated with the procedure

quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, Exelon failed to prescribe an adequate fill and vent procedure for the Unit 1 control room chillers which led to a trip of the 12 chiller on low flow while troubleshooting of chiller compressor 11A was on-going, resulting in an unplanned TS LCO entry.

The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The performance deficiency did not represent a degradation of the radiological barrier function provided for the control room. Additionally, the performance deficiency did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere. Therefore, this finding was determined to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, because between 2014 and 2017 the inspectors noted over 20 IRs documenting issues affecting reliability of the control room chiller system. Exelon failed to thoroughly evaluate the issues associated with the chillers to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, Exelon failed to effectively evaluate previous chiller trips and other issues affecting reliability and to prevent additional trips of the chiller system such as the one that occurred on October 15, 2017. [P.2]

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances." Contrary to the above, on October 15, 2017, Exelon failed to ensure that activities affecting quality were prescribed in a manner appropriate to the circumstances for the Unit 1 control room chillers. Specifically, Unit 1 procedure N1-OP-49 failed to provide adequate instruction for the filling and venting of the control room chillers which led to a low flow condition, chiller trip and a subsequent unplanned TS LCO entry. Exelon's corrective actions included a procedure change to correct the filling and venting process in procedure N1-OP-49. Because this issue is of very low safety significance (Green), and Exelon entered this issue into their CAP as IR 04090200, this finding is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000220/2017004-02, Inadequate Fill and Vent Procedure for Control Room Chiller Results in Unplanned LCO Entry)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 2 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment from service. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon performed emergent work, the inspectors verified that operations personnel promptly assessed and managed

plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 1 risk mitigation actions during 103 EDG maintenance window on October 12, 2017
- Unit 1 12 high pressure coolant injection (HPCI) during Yellow risk condition for planned calibration of 11 HPCI relays on October 18, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Unit 2 'A' RHR bypass valve stroke time changed due to new testing methodology on November 6, 2017
- Unit 2 degraded voltage relay 27BC following trip of Oswego offsite power source 115 kV line 3 on November 6, 2017
- Unit 2 use of test box during reactor protection system surveillance testing on November 8, 2017
- Unit 1 main steam isolation valve 01-01 following packing adjustment on November 20, 2017
- Unit 1 containment spray raw water pump 122 following failure to establish flow conditions for pump curve validation on December 5, 2017
- Unit 2 barrier impairment of internal flood barrier between A RHR and Low Pressure Core Spray (LPCS) system pump rooms on December 12, 2017

The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Exelon's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Exelon.

b. Findings

Introduction. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when Exelon failed to perform an adequate operability determination in accordance with OP-AA-108-115, "Operability

Determinations,” Revision 20, upon identification of Unit 2 degraded internal flood barriers that support operability of ECCS equipment. Specifically, from November 21 until December 10, 2017, Exelon failed to properly evaluate the excavation of an internal flood barrier and either conclude there was a reasonable expectation for operability of the supported ECCS systems, or enter the appropriate technical specification action statement, prior to degrading the barrier. Contrary to this, the inspectors identified that the internal flood barrier was excavated such that there was insufficient material to ensure adequate flood protection.

Description. Nine Mile Point Unit 2 has three RHR pumps to provide low pressure injection for ECCS as well as provide suppression pool cooling, shutdown cooling, and other functions. The ‘B’ and ‘C’ RHR pumps are located adjacent to each other in watertight compartments. Similarly the ‘A’ RHR pump and the LPCS are located in adjacent watertight compartments. The penetrations between the adjacent watertight compartments and the reactor building stairwell have barriers which are credited to protect the adjacent pumps from internal flooding and fire hazards.

On November 21, Exelon commenced a plant modification which involved opening these penetrations in order to run a wire as part of a planned component monitoring modification to the station. This involved drilling an approximately 2-inch diameter hole through a portion of a 6-inch diameter barrier between the ‘B’ and ‘C’ RHR pump rooms and another barrier between the ‘C’ RHR pump room and the adjacent stairwell, which was impaired November 22. Although this was a planned activity, Exelon neither performed an assessment of the operability of supported equipment affected by the barrier being impaired; nor, entered TS 3.0.9 which allows the licensee to defer entry to the support system’s action statement for 30 days and requires a risk evaluation to be performed when a barrier is rendered inoperable. The barrier was not capable of performing its flood protection function with a two inch hole drilled into it.

On December 7, 2017, Exelon personnel drilled another approximately 2-inch diameter hole through a portion of a 6-inch diameter barrier between the LPCS and ‘A’ RHR pump rooms and Exelon entered TS 3.0.9; however, a risk assessment was never completed as required by TS 3.0.9.

On December 10, 2017, during a review of plant barrier impairments, operations personnel recognized that the barriers impaired on November 21 and November 22, 2017 had not been included. Upon discovery of breaches between all four low pressure ECCS subsystems, Exelon administratively entered the 24 hour requirement of TS 3.0.9 and evaluated the impaired penetrations. TS 3.0.9 states that if at least one train of a safety related system is unaffected by the barrier breach, the licensee may defer declaring the supported system inoperable and enter the related TS action statement for 30 days. However, if all trains of the supported safety related system are affected by the breach, the licensee may only defer entry for 24 hours while an evaluation is performed. Exelon recognized the ‘B’ and ‘C’ RHR pump room penetrations were unable to provide flood protection; however, the breach between LPCS and ‘A’ RHR barrier appeared to the operators to still have the flood protection elastomer installed, even though some excavation had taken place. After taking measurements and having a phone discussion with engineering, operators determined that what they observed was sufficient to meet the flood protection requirement for the penetration. Operations then determined the 24-hour TS 3.0.9 requirement was not necessary. Later on December 10, Exelon filled all of the penetrations between the ECCS RHR pump rooms and exited TS 3.0.9.

On December 12, the inspectors evaluated the site's response to the discovery of the flood barrier impairments. Through interviews with the insulators, the inspectors discovered the hole between the LPCS and 'A' RHR pump rooms was excavated entirely and could not perform its flood protection function. The operators that responded on December 10 misidentified Kaewool insulation installed in the penetration as the remaining flood barrier, and gave engineering that dimension. Kaewool is typically installed by the insulators to assist in the installation of the flood barrier elastomer, but has no flood protection capabilities. OP-AA-108-115, "Operability Determinations," Section 4.1.5 states in part "immediately determine operability from a detailed examination of the deficiency." Contrary to this requirement, the inspectors determined that Exelon did not perform a detailed examination of the degraded internal flood barrier, such that Exelon failed to confirm what material is credited for flood protection, and ensure adequate material existed prior to determining there was a reasonable expectation for operability, resulting in a reasonable doubt of operability and requiring additional analysis to verify operability. Therefore, the inspectors determined it was not appropriate to exit TS 3.0.9 based upon this initial evaluation; however, the barriers were restored within 24 hours of discovery.

Exelon entered this issue into the CAP as IR 04082686. Exelon re-examined the internal flood barrier between the LPCS pump room and the 'A' RHR pump room; and performed an evaluation that determined in accordance with the design basis for a medium energy line crack in the RHR piping with assumed single failure of one train of RHR, one ECCS pump would remain operable. Additionally, credited safety-related flood detection equipment and safety-related sump pumps in the adjacent rooms, would ensure the associated pump remained operable given the size of the hole and wall height of the penetration. As such, since the supported ECCS equipment was evaluated to have remained operable, this issue would not have been reportable in accordance with 10 CFR 50.73, "Licensee Event Report System."

Exelon initiated a CAPE associated with IR 04082686 to address the inspectors' concerns. Exelon has initiated corrective actions which include additional training associated with TS 3.0.9, including a focus on the need for risk assessments when entering TS 3.0.9, and a procedure change to CC-AA-201, "Plant Barrier Control Program," and CC-NM-201-1001, "Plant Barrier Control Program Implementation," which is the NMPNS specific procedure to address the vulnerabilities associated with impairing multiple required barriers.

Analysis. The inspectors determined that Exelon's failure to perform an adequate operability determination in accordance with OP-AA-108-115, "Operability Determinations," Revision 20, upon identification of degraded internal flood barriers that support operability of ECCS equipment was a performance deficiency that was reasonably within Exelon's ability to foresee and correct. This finding is more than minor because it is associated with the human performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, from November 21 until December 10, 2017, Exelon failed to adequately evaluate the operability of a degraded internal flooding barrier and the potential impact on operability of the supported ECCS system equipment. The inspectors identified that the internal flood barrier was excavated such that there was not sufficient material to ensure adequate flood protection, and resulted in a reasonable

doubt for the operability of the supported ECCS systems. This finding is also similar to example 3.j and 3.k of IMC 0612 Appendix E, "Examples of Minor Issues," issued August 11, 2009, because the condition identified by the inspectors resulted in a reasonable doubt for the operability of the ECCS supported systems and additional analysis was necessary to verify operability.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green), because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to vulnerability to external initiating events.

This finding has a cross-cutting aspect in the area of Human Performance, Work Management, because Exelon failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. As a result, Exelon personnel failed to recognize that work activities that impaired internal flood barriers on both Division I and II low pressure ECCS pump rooms were executed simultaneously, which led to an unplanned entry into TS Limiting Condition for Operation (LCO) 3.0.9. [H.5]

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings...and shall be accomplished in accordance with these instructions, procedures, or drawings." Quality procedure OP-AA-108-115, "Operability Determinations," Section 4.1.5 states in part "immediately determine operability from a detailed examination of the deficiency." Contrary to this requirement, from November 21 until December 10, 2017, the inspectors determined that Exelon did not perform a detailed examination of a known degraded internal flood barrier which is credited to support operability of safety-related ECCS equipment. This resulted in a reasonable doubt of operability and required additional analysis to verify operability. Because this issue is of very low safety significance (Green), and Exelon entered this issue into their CAP as IR 04082686, this finding is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy.

**(NCV 05000410/2017004-03, Inadequate Operability Determination for Impaired Internal Flood Barriers)**

1R19 Post-Maintenance Testing (71111.19 – 2 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, and reviewed test data to verify quality control hold points were performed and checked and that results adequately demonstrated restoration of the affected safety functions.



- Unit 1 11 feedwater pump following planned maintenance on October 19, 2017
- Unit 2 'D' service water pump following bearing maintenance after high bearing temperature on December 21, 2017

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedules and outage risk plans for the Unit 1 forced maintenance outage to support a containment entry in order to identify the source of increased containment unidentified leakage on November 18-19, 2017. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Activities that could affect reactivity
- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- ER-AB-331-1006, Boiling Water Reactor (BWR) Reactor Coolant System Leakage Monitoring on October 4, 2017 (RCS)

- N2-OSP-RSS-R003, Division I Remote Shutdown Panel Operability Test on October 13, 2017
- N2-OSP-RPS-Q001, Reactor Protection System (RPS) Turbine Stop Valve Closure Logic, Control Valve Fast Closure Scram Functional Tests and Turbine Valve Cycling on November 16, 2017
- N2-OSP-EGS-M@002, Diesel Generator and Diesel Air Start Valve Operability Test Division III, on November 29, 2017
- N1-ST-M1B, 12 Liquid Poison Pump Operability Test on December 7, 2017 (in-service test)
- N1-ST-M1A, 11 Liquid Poison Pump Operability Test on December 18, 2017 (in-service test)

b. Findings

No findings were identified.

### **Cornerstone: Emergency Preparedness**

#### 1EP6 Drill Evaluation (71114.06 – 1 sample)

##### Training Observations

a. Inspection Scope

The inspectors observed a simulator training scenario for Unit 2 licensed operators on November 1, 2017, which required emergency plan implementation by an operations crew. Exelon planned for this evolution to be evaluated and included in performance indicator (PI) data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note if there were any weaknesses and deficiencies in the crew's performance and ensure that Exelon evaluators noted the same issues and entered them into the CAP.

b. Findings

No findings were identified.

## **4. OTHER ACTIVITIES**

#### 4OA2 Problem Identification and Resolution (71152 – 4 samples)

##### .1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed

adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended condition report (CR) screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues documented by Exelon in trend reports, site performance indicators, major equipment problem lists, the system health database, the maintenance rule database, and maintenance or CAP backlogs. The inspectors also reviewed Exelon's CAP database for the third and fourth quarters of 2017 to assess issue reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRC's daily issue report review (Section 4OA2.1). The inspectors reviewed Exelon department monthly and quarterly trend reports for the third and fourth quarters of 2017, conducted under PI-AA-101-1001, "Performance Monitoring and Analysis Manual," Revision 0, to verify that Exelon personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings

No findings were identified.

The inspectors evaluated a sample of issues and events that occurred over the course of the third and fourth quarters of 2017 to determine whether issues were appropriately considered as emerging or adverse trends. The inspectors verified that these issues were addressed within the scope of the CAP or through department review.

The evaluation did not reveal any new trends that could indicate a more significant safety issue. The inspectors assessed that Exelon personnel were identifying trend issues at a low threshold and entering them into the CAP for resolution and were appropriately prioritizing investigation reviews. The inspectors noted minor adverse trends identified by Exelon staff in the areas of station ground alarms (IRs 04029199 and 04029359), uncoupled control rods (IR 04039827), and control rod double notching (IR 04040859).

There were no adverse safety consequences as a result of these low-level trend issues. Based on the overall results of the semi-annual trend review, the inspectors determined that Exelon was properly identifying adverse trends at NMPNS before they became more significant safety problems. The inspectors independently evaluated the deficiencies noted above for significance in accordance with the guidance in IMC 0612,

Appendix B, “Issue Screening,” and Appendix E, “Examples of Minor Issues.” The inspectors determined these conditions were deficiencies of minor significance and, therefore, are not subject to enforcement action in accordance with the NRC’s Enforcement Policy.

.3 Annual Sample: Unit 1 Failure of 600 Volts Alternating Current Breaker during Emergency Service Water Pump 12 Surveillance Testing

a. Inspection Scope

The inspectors performed an in-depth review of the failure of 12 ESW pump 600 volt alternating current (VAC) GE AK breaker that occurred on August 12, 2017 during surveillance testing. Exelon performed a CAPE to determine the cause of the failure.

The inspectors assessed Exelon’s problem identification threshold, cause analysis, extent of condition review, and the prioritization and timeliness of Exelon’s corrective actions to determine whether Exelon appropriately identified, characterized, and corrected problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken with the requirements of Exelon’s CAP and 10 CFR Part 50, Appendix B.

Findings and Observations

No findings were identified.

On August 1, 2017, Unit 1 attempted to start the 12 ESW pump for planned quarterly surveillance testing. Immediately following the turning of the start switch by the operator in the main control room, the operator observed motor amperage spike and fall, and noted the red light that normally indicates the pump is running remained unlit. Control room operators also received annunciators indicating 12 ESW pump tripped. Operators then attempted a second start of the pump, with the same result.

Exelon immediately began troubleshooting by racking out the breaker, performing inspections, and cycling the breaker manually. The breaker was then racked into the test position and remotely operated successfully. Although no immediate cause was discovered, operators were able to restore the breaker and complete the surveillance test successfully. Following restoration, on August 23, 2017, Exelon removed the breaker for a 20-year preventive maintenance overhaul with vendor support. During the preventive maintenance, Exelon identified a combination of factors that contributed to the 12 ESW breaker not closing properly upon demand, which included tacky lubrication and breaker trip latch binding. Although component grease did not indicate hardening, it did show signs of oxidation and was tacky to the touch. The closing coil solenoid showed signs of rubbing, and the trip bar bearings were free moving, showing excessive lateral movement. It was also identified that the ‘C’ phase breaker contacts were out of alignment. Exelon also identified that the ‘A’ phase of the instantaneous overcurrent trip device was out of tolerance low, but still met the threshold for being within the 10 percent tolerance of its nominal value. Exelon completed the breaker overhaul by changing out parts, performing re-adjustments, and re-greasing the breaker. Exelon also performed a CAPE to assess factors that contributed to the failure of the breaker to properly operate upon demand.

The inspectors reviewed the failure modes causal tree, the CAPE, and performed a review of similar 600 VAC GE AK breaker failures over the past 5 years. Exelon's CAPE was not able to identify any one particular cause, yet attributed the failure to the combination of factors discussed above. As a result, Exelon generated a number of action items to be completed to address the failure of 12 ESW pump and to perform a 20-year preventive maintenance inspection of all 600 VAC safety related breakers at Unit 1 as part of extent of condition.

The inspectors' review identified that Exelon failed to recognize that a previous 12 ESW breaker failure that occurred on March 22, 2015, as documented in IR 02472486, had identified inadequacies in electrical preventive maintenance procedure N1-EPM-GEN-145, "Inspection and Testing of AK-15/25 Breakers and Associated Motors," Revision 00800 to re-verify proper alignment and engagement of the breaker primary contacts following breaker maintenance. The corrective action was to complete a revision of N1-EPM-GEN-145 to establish a post maintenance test requirement to verify contact wipe settings are still within tolerance following breaker re-assembly after instantaneous overcurrent trip device replacement or any other maintenance that separates the breaker. Given that Exelon identified contact misalignment during the 20 year preventive maintenance on August 23, 2017, the inspectors determined that corrective actions from the March 2015 apparent cause evaluation were not fully effective in resolving this contributing cause. The inspectors also noted that given the number of contributing causes identified, Exelon did not fully evaluate potential causes from maintenance practices that may have resulted in the breaker failing to properly operate. The inspectors also identified eight different failures of 600 VAC GE AK breakers over the past 5 years due to similar causes. Exelon failed to review those causes as part of their extent of condition to determine if there were applicable failure modes. Exelon created IR 04093883 to document the inspectors' concerns, and generated actions to review the failure modes and to determine if any lessons learned apply from previous failures. The review will also include a review of maintenance practices that currently exist and identify if there are any potential enhancements.

The inspectors determined that although Exelon failed to develop fully effective corrective actions related to contact alignment and failed to adequately review previous cause evaluations in their extent of condition, or consider potential maintenance practices as part of their extent of condition review, this performance deficiency was determined to be of minor significance. The issues identified by the inspectors would not have individually contributed to failure of the breaker, and it would be common to see the types of issues identified by Exelon following a 20 year preventive maintenance. Exelon also identified and addressed multiple additional contributing causes which combined to contribute to the August 7, 2017 failure. The inspectors determined that Exelon's actions appear adequate to address reliability concerns with the 12 ESW, and other 600 VAC GE AK breakers. Exelon's additional review to address the concerns with potential contributing causes due to maintenance practices also appears adequate to ensure preventive maintenance results in reliable breaker operation. As a result, no violation of NRC requirements was identified.

#### .4 Annual Sample: Unit 2 Un-annealed Red Brass Instrument Air Pipe Rupture

##### a. Inspection Scope

The inspectors performed an in-depth review of Exelon's CAPE for the failure of un-annealed red brass instrument air pipe that occurred at Unit 2 on July 13, 2017, resulting in a plant transient and unplanned downpower.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon appropriately identified, characterized, and corrected problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B. In addition, the inspectors performed field walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

##### b. Observations

As documented in previous NRC inspection reports, NMPNS has had weakness noted in the performance of extent of condition reviews between the two units. The inspectors reviewed Exelon's extent of condition review for similar issues for Unit 1. Exelon performed an evaluation of similar instrument air piping in Unit 1 and determined in 2008 corrective action had been developed to address this concern. All un-annealed red brass piping was either to be replaced or coated. Exelon's CAPE reviewed those actions to ensure the associated work orders had been completed. Exelon's CAPE stated that all Unit 1 un-annealed red brass pipes had been either coated or replaced. In fact, all un-annealed red brass pipe had been replaced and none were coated. This is a relevant detail since coated pipes are still subject to stress corrosion and cracking initiated from the inner diameter of the pipe as was the case in the July 13, 2017 failure on Unit 2. Therefore the coating option was only a short term action. The inspectors determined that the cause evaluation team and Exelon's management review committee did not identify that they had not coated any items on Unit 1, which would have required additional actions. However, the inspectors determined this issue was not more than minor because it was an administrative error and the overall conclusions of extent of condition review were not adversely impacted by the error.

##### c. Findings

Introduction. The inspectors documented a self-revealing Green FIN of CNG-CA-1.01-1000, "Corrective Action Program," Revision 01100, because NMPNS staff failed to implement corrective actions at NMPNS Unit 2 to remove and replace all un-annealed red brass piping for the instrument air system during the 2008 and 2010 refueling outages. Specifically, on July 13, 2017, Unit 2 experienced a rupture of un-annealed red brass instrument air pipe which resulted in a feedwater pump trip and a reactor recirculation pump runback to 49 percent.

Description. On July 13, 2017, Unit 2 experienced a failure of un-annealed red brass piping that resulted in the trip of a feedwater pump, the opening of the moisture separator drain tank dump valve, trips of 'A' and 'B' heater drain pumps, trip of the 'C' feedwater pump, and a reactor recirculation runback to 49 percent. Exelon entered this

issue into the CAP as IR 04031685, and performed a CAPE. This transient counted as an Unplanned Power Change per 7000 Critical Hours on the NRCs Performance Indicator.

The inspectors identified several additional historical failures of un-annealed red brass instrument air piping on Unit 2, including a failure in March 2008, for which Nile Mile Point received a Green FIN 05000410/2008007-01, "Failure to perform a technical evaluation or restore a nonconformance to the original design requirement," as documented in NRC Inspection Report 2008007. On March 26, 2008, Unit 2 experienced a similar loss of instrument air due to a rupture in a 2-inch diameter un-annealed red brass pipe. At the time, a Category 2 CR 02037908, was entered into the CAP and an apparent cause evaluation was performed under the previous owner's (Constellation Nuclear Energy Group) CAP. The cause of the failure was determined by NMPNS to be stress corrosion cracking of un-annealed red brass piping due to chemical attack by ammonia based materials inside the piping. NMPNS staff established corrective actions to replace all un-annealed red brass piping during the 2008 and 2010 refueling outages.

Exelon's CAPE determined that corrective actions from NMPNS staff's CR 02037908 to replace un-annealed red brass instrument air piping during the 2008 and 2010 refueling and maintenance outages were not completed. NMPNS staff's CAP procedure CNG-CA-1.01-1000, "Corrective Action Program," Revision 01100, Section 5.8.F states, "corrective actions shall be closed with attached documentation providing objective evidence the action was performed for all actions linked to...corrective actions for Category 1 and 2 condition reports." Procedure CNG-CA-1.01-1000, Section 5.10.C states, "closure of Category 1 and 2 condition reports to other established processes is not permitted. Full closure means that all corrective and preventive actions (including all physical work) needed to address all aspects of the issue are complete." Contrary to this requirement, NMPNS staff had closed actions to WOs to be performed. Several of the associated WOs were later cancelled in error and NMPNS staff did not complete replacement of the un-annealed red brass piping, ultimately resulting in the repeat failure on July 13, 2017.

Exelon's corrective actions for the July 13, 2017, failure of un-annealed red brass instrument air piping included wrapping the instrument air piping with a material that both supports the piping and prevents potential stress corrosion cracking. Exelon has developed work orders to replace the piping in the upcoming outage in spring 2018. As an extra measure, Exelon has ensured that removal of the work orders from the RFO will not be permitted without approval of the Site Vice President. Exelon also improved staff training for accountability and work checking to verify that generated work orders are completed and closed out.

Analysis. The inspectors determined that NMPNS staff's failure to implement corrective actions to replace un-annealed red brass piping following a previous failure in 2008 in accordance CNG-CA-1.01-1000, "Corrective Action Program," Revision 01100, was a performance deficiency that was reasonably within NMPNS staff's ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the design control attribute of the Initiating Events cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, NMPNS staff failed to complete corrective actions to replace Unit 2

un-annealed red brass instrument air piping, which was susceptible to stress corrosion cracking, resulting in a feedwater pump trip and reactor recirculation runback to 49 percent on July 13, 2017. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued on October 7, 2016, and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012. The inspectors determined that the finding was of very low safety significance (Green) because it did not result in the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and affected mitigation equipment.

The inspectors determined that this finding did not have a cross-cutting aspect because the performance deficiency occurred greater than 3 years ago; therefore, it is not considered to be indicative of current plant performance. It is also recognized that, Exelon was not the licensee at Nine Mile Point at the time and Exelon's CAP was not in place at the time of the performance deficiency.

Enforcement. Enforcement action does not apply because this performance deficiency did not involve a violation of a regulatory requirement. Specifically, the SSCs in this event are not safety-related. This issue was entered into Exelon's CAP as IR 04031685. Because this finding does not involve a violation and is of very low safety significance, it is identified as a finding. **(FIN 05000410/2017004-04, Ineffective Correction Action Results in Failure of Instrument Air System)**

.5 Annual Sample: Unit 2 Automatic Reactor Scram on High Pressure during Turbine Valve Testing

a. Inspection Scope

The inspectors performed an in-depth review of the condition that resulted in an automatic reactor scram of the Unit 2 reactor on August 5, 2017. Specifically, during routine main turbine valve reactor protection system testing, Exelon experienced a sudden closure of turbine control valves, resulting in a high reactor pressure, and subsequent automatic reactor scram. Exelon provided a 60-day notification to the NRC of this condition under 10 CFR 50.73 (a)(2)(iv)(A) due to the automatic scram signal during performance of quarterly turbine stop valve surveillance testing.

The inspectors assessed Exelon's root cause analysis, extent of condition review, troubleshooting actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon appropriately identified, characterized, and corrected problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken with the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B. In addition, the inspectors assessed the operators' response to the scram through a review of plant parameter data, operator logs, post trip review documentation, and transient response procedures.

b. Findings and Observations

No findings were identified.



On August 5, 2017, while performing quarterly turbine stop valve surveillance testing in accordance with procedure N2-OSP-RPS-Q001, "RPS Turbine Stop Valve Closure Logic, Control Valve Fast Closure Scram Functional Tests & Turbine Valve Cycling," Revision 00900, Unit 2 experienced an automatic reactor scram due to high reactor pressure. The high pressure condition was caused by a spurious loss of turbine control valve demand resulting in partial closure of the valves. The inspectors reviewed the operators' response to the transient and identified no issues of concern.

The inspectors reviewed the Exelon root cause analysis documented under IR 4039435. Exelon was unable to identify a root cause of the event, but concluded that the most likely cause was spurious actuation of load limit relays KL 186 and KL 187, due to an intermittent ground and/or an induced voltage within the load limit circuit. Exelon informed their conclusion with a review of operating experience at other nuclear stations that experienced similar conditions that resulted in spurious closure of turbine control valves. As part of corrective actions, Exelon generated a temporary modification to remove relays KL 186 and KL 187 from the turbine load limit circuit. Although this action removed the potential for spurious closure of the turbine control valves, it also caused the turbine bypass valves to have a delayed response time, requiring Unit 2 to enter TS 3.7.5, "Main Turbine Bypass System," and implement a thermal limit penalty against minimum critical power ratio (MCPR) in accordance with the core operating limits report. Exelon also modified the main turbine valve reactor protection system testing procedure N2-OPS-RPS-Q001, to minimize the severity of a potential ground. Long-term corrective actions to prevent recurrence include a planned modification of the turbine electro-hydraulic control system to a fault tolerant digital system during the 2018 refueling outage. The inspectors concluded that Exelon's overall response to the event and corrective actions was commensurate with the safety significance, was timely, and included appropriate compensatory measures.

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 –1 sample)

##### (Closed) Licensee Event Report (LER) 05000410/2017-001-00: Automatic Reactor Scram due to High Reactor Pressure

On August 5, 2017, while performing quarterly turbine stop valve surveillance testing in accordance with procedure N2-OSP-RPS-Q001, "RPS Turbine Stop Valve Closure Logic, Control Valve Fast Closure Scram Functional Tests & Turbine Valve Cycling," Revision 00900, Unit 2 experienced an automatic reactor scram due to high reactor pressure. The high pressure condition was caused by a spurious loss of turbine control valve demand resulting in partial closure of the valves. Exelon provided a 60-day notification to the NRC of this condition under 10 CFR 50.73 (a)(2)(iv)(A) due to the automatic scram when critical. Exelon was unable to identify a root cause of the event, but concluded that the most likely cause was spurious actuation of load limit relays KL 186 and KL 187, due to an intermittent ground and/or an induced voltage within the load limit circuit. The NRC evaluation of this event is discussed in Section 4OA2.5 of this report. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

#### 4OA5 Other Activities

##### Institute of Nuclear Power Operations Report Review

##### a. Inspection Scope

The inspectors reviewed the final report for the Institute of Nuclear Power Operations (INPO) plant assessment of NMPNS conducted in February 2017. The inspectors also reviewed the final report for the INPO accreditation team evaluation of the maintenance, chemistry, and radiological protection technical training programs conducted in February 2017. The inspectors evaluated these reports to ensure that NRC perspectives of Exelon's performance were consistent with any issues identified during the assessments. The inspectors also reviewed these reports to determine whether INPO identified any significant safety issues that required further NRC follow-up.

##### b. Findings

No findings were identified.

#### 4OA6 Meetings, Including Exit

On January 24, 2018, the inspectors presented the overall inspection results to Mr. Peter Orphanos, Site Vice President, and other members of the NMPNS staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

On October 19, 2017, the inspectors presented the inspection results for the Licensee operator requalification inspection documented in Section 1R11.04 of this report to Mr. Greg Elkins, Manager Operator Training, and other members of licensee staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

#### 4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Exelon and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a NCV.

Title 10 CFR 50.65(a)(4) requires, in part, "...the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Exelon procedure WC-AA-101-1006, "On-Line Risk Management and Assessment," Revision 001, Section 4.1.3, states to consider "work activities that cause equipment to be unavailable (e.g., trains of systems)" for assessment of risk under the requirements of 10 CFR 50.65(a)(4). Contrary to the above, on October 17, 2017, Exelon identified a discrepancy in PARAGON (risk software) that resulted in an improper risk assessment for the day's planned work. Review and correction of the error resulted in an elevated risk condition of Yellow during Nine Mile Point Unit 1, 11 feedwater pump (FW) maintenance. This performance deficiency was determined to be more than minor because it adversely affected the human performance attribute of the Mitigating Systems cornerstone and affected cornerstone objective to ensure the availability, reliability, and

capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, on October 17, 2017, Exelon identified a planned activity that resulted in an unplanned Yellow risk activity during planned maintenance of the 11 FW pump. In addition, IMC 0612, Appendix E, "Examples of Minor Issues," under Section 7, "Maintenance Rule," Example E for inadequate risk assessment states in part that a more-than-minor issue would put the plant into a higher licensee-established risk category.

The finding was evaluated using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The finding was determined to affect the overall plant risk with the 11 FW Pump being out of service for maintenance with PARAGON not elevating the overall plant risk from green to yellow. The risk deficit was elevated and determined to not be greater than 1E-6 event per year for Incremental Core Damage Probability Differential and not greater than 1E-7 events per year for Incremental Large Early Release Probability Differential. Therefore, the finding was determined to be of very low safety significance (Green). Exelon entered this issue into its CAP as IR 04064241.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

P. Orphanos, Site Vice President  
 R. Kreider, Plant Manager  
 M. Alexander, Senior Operations Training Instructor  
 R. Bugelholl, Director Site Work Management  
 M. Busch, Director Site Maintenance  
 G. Elkins, Manager Operations Training  
 B. Geiss, Unit 1 Shift Operations Superintendent  
 M. Gray, Manager Site Radiation Protection  
 P. Isham, Senior Operations Training Instructor  
 M. Khan, Director Site Engineering  
 K. Kristensen, Regulatory Principle Engineer  
 M. Kunzwiler, Manager Site Security  
 D. Moore, Manager Regulatory Assurance  
 R. Pellegrino, Operations Requal Training Lead  
 R. Pritchard, Regulatory Assurance  
 J. Prosachik, Engineering Manager  
 J. Rizzo, Senior Operations Training Instructor  
 J. Sawyer, Unit 2 Shift Operations Superintendent  
 B. Shultz, Senior Manager Operations Support and Services  
 T. Tanguay, Manager Site Chemistry, Environment and Radwaste  
 J. Thompson, Director Site Operations  
 N. Tryt, Senior Manager Engineering  
 J. Tsardakas, Director Site Training  
 D. Tulowiecki, Manager Site Maintenance

### LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

#### Opened/Closed

05000220/2017004-01	NCV	Main Control Room Annunciators 10 CFR 50.65(a)(2) Demonstration Not Met (Section 1R12.b.1)
05000220/2017004-02	NCV	Inadequate Fill and Vent Procedure for Control Room Chiller Results in Unplanned LCO Entry (Section 1R12.b.2)
05000410/2017004-03	NCV	Inadequate Operability Determination for Impaired Internal Flood Barrier (Section 1R15)
05000410/2017004-04	FIN	Ineffective Correction Action Results in Failure of Instrument Air System (Section 4OA2.4)

#### Closed

0505000410/2017-001-00	LER	Automatic Reactor Scram Due to High Reactor Pressure (Section 4OA3)
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### LIST OF DOCUMENTS REVIEWED

**Section 1R01: Adverse Weather Protection**

Procedures

N1-OP-64, Meteorological Monitoring, Revision 01700  
N2-OP-102, Meteorological Monitoring, Revision 02200  
WC-AA-107, Seasonal Readiness, Revision 18

**Section 1R04: Equipment Alignment**

Procedures

N1-OP-18, Service Water System, Revision 04200  
N2-OP-35, Reactor Core Isolation Cooling, Revision 01400  
OP-AA-108-117, Protected Equipment Program, Revision 5  
OP-NM-108-117, Protected Equipment Program at Nine Mile Point, Revision 00500

Drawings

C-18022-C, Service Water Reactor and Turbine Buildings Piping & Instrumentation Diagram,  
Sheet 1, Revision 83  
PI-31A, Piping & Instrument Diagram Residual Heat Removal, Revision 24  
PI-31B, Piping & Instrument Diagram Residual Heat Removal, Revision 21  
PI-31C, Piping & Instrument Diagram Residual Heat Removal, Revision 15  
PI-31D, Piping & Instrument Diagram Residual Heat Removal, Revision 21  
PI-31E, Piping & Instrument Diagram Residual Heat Removal, Revision 21  
PI-31F, Piping & Instrument Diagram Residual Heat Removal, Revision 16  
PI-31G, Piping & Instrument Diagram Residual Heat Removal, Revision 15

**Section 1R05: Fire Protection**

Procedures

DCD-805, Nine Mile Point Unit 1 NFPA 805 Design Criteria, Revision 1  
N1-PFP-0101, Unit 1 Pre-Fire Plans, Revision 00500

**Section 1R07: Heat Sink Performance**

Procedure

N1-ST-Q25, Emergency Diesel Generator Cooling Water Quarterly Test, Revision 02700

Work Orders

C92626426  
C92624362  
C93538548

Miscellaneous

Maintenance Rule System Basis Document, Emergency Diesel Generator, EDG Raw Water, October 19, 2017

MIS Report NC-55-1553, NDE Report BOP-ET-15-013, Diesel Jacket Water Cooler, 3 (HTX- 79 03), Eddy Current Inspection Report, September 22, 2015

MIS Report NC-56-1553, NDE Report BOP-ET-15-014, Diesel Jacket Water Cooler, 4 (HTX 79 04), Eddy Current Inspection Report, September 22, 2015

**Section 1R11: Licensed Operator Regualification Program and Performance**

Procedures

N1-OP-31, Tandem Compound Reheat Turbine, Revision 04500

N1-OP-43B, Normal Power Operations, Revision 02400

N1-SOP-31.1, Turbine Trip, Revision 00400

N2-OP-101D, Power Changes, Revision 02500

N2-OSP-RPS-Q001, RPS Turbine Stop Valve Closure Logic Control Valve Fast Closure Scram Functional Tests and Turbine Valve Cycling, Revision 00900

OP-AA-105-101, Administrative Process for NRC License and Medical Requirements, Revision 21

TQ-AA-150, Operator Training Programs, Revision 14

TQ-AA-155, Conduct of Simulator Training and Evaluation, Revision 6

TQ-AA-201, Examination Security and Administration, Revision 17

TQ-AA-306, Simulator Management, Revision 8

Action Requests

04050347

04051834

04064681

04064685

Licensed Operator Regualification Examinations

Week 1 and Week 2 Written Exams, Job Performance Measures and Scenarios

Simulator Action Requests

SWR 132541

SWR 132539

SWR 16170

SWR 15992

Simulator-Related Test Documents

Core Performance Test, N2-RESP-10 Subcooled Critical Comparison, September 6, 2016

Core Performance Test, Power Coefficient of Reactivity and Control Rod Worth, September 19, 2016

Cycle 16 Real Time Test, June 10, 2017

Cycle 16 Limits of Simulation Test, June 10, 2017

Post-Event Test, Sudden Power Reduction Due to Feedwater Transient (Plant Event July 13, 2017)

Simulator Steady State Test, October 8, 2017

Transient Test, Simultaneous Trip of All Recirculation Pumps

Unit 2 Scenario Based Test, Scenario 115049, September 21, 2016

Miscellaneous

ACE (CR 02656849), Unit 2 Tagging Event

**Section 1R12: Maintenance Effectiveness**Procedures

ER-AA-310, Implementation of the Maintenance Rule, Revision 10

N1-IMP-104-001, Reactor Building Floor/Equipment Drain Sump Level and Wall Mounted Level Switch Instrument Calibration, Revision 00700

Drawings

C-18045-C, Sheet 10, Waste Disposal System Piping & Instrumentation Diagram, Revision 28

Issue Reports

04075137*	02613960	03994986
02027620	02613962	04020205
02059614	02613964	04023105
02080143	02615545	04024872
02525555	02615913	04025046
02606753	02644668	04081698
02609001	02714501	
02609453	03960920	

Work Order

C93359365

C93409621

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**Procedures

N1-ST-Q3, High Pressure Coolant Injection Pump and Check Valve Operability Test, Revision 01800

OP-AA-108-117, Protected Equipment Program, Revision 4

OP-NM-108-117, Protected Equipment Program at Nine Mile Point, Revision 00200

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

N1-ST-Q6D, Containment Spray System Loop 122 Quarterly Operability Test, Revision 01400

N2-ARP-852100, 2CEC\*PNL852 Series 100 Alarm Response Procedures, Revision 00500

NMPNS-IST-001, Pump and Valve Inservice Testing Program, Revision 8

S-MMP-GEN-201, Site Valve Packing Procedure, Revision 01100

Drawings

0007.225-001-007, Elementary Diagram Reactor Protection System, Revision 8

0007.225-001-008, Elementary Diagram Reactor Protection System, Revision 8

0007.225-001-009, Elementary Diagram Reactor Protection System, Revision 9

0007.225-001-011, Elementary Diagram Reactor Protection System, Revision 8

C-18012-C, Sheet 1, Reactor Containment Spray Raw Water System Piping & Instrumentation Diagram, Revision 25

C-18012-C, Sheet 2, Reactor Containment Spray System Piping & Instrumentation Diagram, Revision 47  
 ESK-8ENS01, Sheet 2, AC Elementary Diagram Potential Circuit Bus 2ENS\*SWG101 Relay and Meter, Revision 16  
 12177-ESK-7ENS02, Sheet 1, AC and DC Elementary Diagram – Miscellaneous AC and DC Circuits Emergency Switchgear Division I and II Computer Alarms, Revision 11  
 12177-ESK-7ENS02, Sheet 2, AC and DC Elementary Diagram – Miscellaneous AC and DC Circuits Emergency Switchgear Division I and II Computer Alarms, Revision 11  
 ESK-08SPR001, Sheet 1, AC Elementary Diagram Current Circuit Transformer 2RTX-XSR1A Relay, Revision 15  
 ESK-10IHA109A, Sheet 1, D.C. Elementary Diagram Annunciator System, Revision 11  
 ESK-05ENS014, D.C. Elementary Diagram – 4KV SWGR. CONT. Bus 2ENS\*SWG101 UV & Load Sequencing, Revision 12  
 LSK-24-9.4A, Sheet 1, Logic Diagram Standby Diesel Generator Load Sequence, Revision 12

#### Issue Reports

04045082	04055602	04061889	04068702
04069761	04076215	04082686	

#### Work Orders

C92393870	C92396681	C92741651	C93098917
C93294792	C93389045	C93503995	C93573360

#### Miscellaneous

10 CFR 50.59 Applicability Determination for N2-OSP-RPS-Q001, RPS Turbine Stop Valve Closure Logic, Turbine Control Valve Fast Closure Scram Functional Tests and Turbine Valve Cycling, Revision 1  
 10 CFR 50.59 Applicability Determination for N2-OSP-MSS-Q002, Main Steam Isolation Valve Partial Exercise Test and Functional Test of RPS Main Steam Isolation Valve Closure in Operation Condition 1 or 2, Revision 1  
 Data Sheet with All Parameters IV-01-01 (NMP-1) AC Motor Operated Generic Letter 96-05 Globe Valve Control Parameters, Revision 0  
 EC-136, Degraded Voltage Relay Setpoint, Revision 4  
 EC-196, Degraded Grid Relay, Undervoltage Relay and Associated Timer Relay Calculation, Revision 3  
 Fermi LER 341-2017-001, Loss of Reactor Protection System Scram Function During Main Steam Isolation Valve and Turbine Stop Valve Channel Functional Tests Due to Use of a Test Box  
 SPPD-MOV, Motor Operated Valve Program, Revision 0  
 Unit 2 UFSAR Section 8.3, Revision 22  
 Valve Packing Datasheet: IV-01-01, Revision 2

### **Section 1R19: Post-Maintenance Testing**

#### Procedures

N1-ST-Q3, High Pressure Coolant Injection Pump and Check Valve Operability Test, Revision 01800  
 N2-OSP-SWP-Q004, Service Water Pump and Valve Operability Test, Revision 01500



Issue Reports

04082089

04083579

Work Order

C93588953

**Section 1R20: Refueling and Other Outage Activities**

Procedures

N1-SOP-31.1, Turbine Trip, Revision 00500

N1-OP-31, Tandem Compound Reheat Turbine, Revision 04600

N1-OP-43A, Plant Startup, Revision 04700

N1-OP-43B, Normal Power Operations, Revision 02400

N1-OP-43C, Plant Shutdown, Revision 02400

**Section 1R22: Surveillance Testing**

Procedures

ER-AB-331-1006, BWR Reactor Coolant System Leakage Monitoring and Action Plan, Revision 2

N1-ST-M1A, Liquid Poison Pump 11 Operability Test, Revision 01100

N1-ST-M1B, Liquid Poison Pump 12 Operability Test, Revision 01100

N2-EPM-GEN-R@576, Remote Shutdown Panel 2CES\*PNL405 Switch Checks, Revision 00400

N2-OSP-EGS-M@002, Diesel Generator and Diesel Air Start Valve Operability Test, Division III,  
Revision 02001

N2-OSP-RPS-Q001, RPS Turbine Stop Valve Closure Logic, Control Valve Fast Closure Scram  
Functional Tests and Turbine Valve Cycling, Revision 00700

N2-OSP-RSS-R003, Service Water Remote Shutdown Operability Test, Revision 00200

Issue Reports

04058998

01700507

**Section 40A2: Problem Identification and Resolution**

Procedures

CNG-CA-1.01-1000, Corrective Action Program, Revision 01101

EOP-RPV, RPV Control, Revision 01500

N1-EMP-GEN-145, Maintenance of 600V Breakers Type AK-2-15 and Type AK-2-25, Revision  
00701

N1-EPM-GEN-153, Inspection and Testing of AK-15/25 Breakers and Associated Motors,  
Revision 00800

N1-RCPM-GEN-155, Load Testing of AK and ITE Breaker Trip Devices, Revision 00200

N2-ARP-603100, 2CEC\*PNL603 Series 100 Alarm Response Procedures, Revision 00200

N2-OSP-RPS-Q001, RPS Turbine Stop Valve Closure Logic Control Valve Fast Closure SCRAM  
Functional Tests & Turbine Valve Cycling, Revision 00600

N2-SOP-21, Turbine Trip, Revision 00800

N2-SOP-101C, Reactor SCRAM, Revision 01300

PI-AA-125, Corrective Action Program (CAP) Procedure, Revision 006

PI-AA-101-1001, Performance Monitoring and Analysis Manual, Revision 0

PI-AA-101-1002, PI Management Review Meetings and Reporting, Revision 0  
 PI-AA-125-1003, Corrective Action Program Evaluation Manual, Revision 4

#### Issue Reports

04093883*	03994672	04040859
01700560	04029199	04043138
01700898	04029359	04043795
01995429	04039435	04045290
01997474	04039435	04050040
01998932	04039492	04051817
02003523	04039494	04052425
02004586	04039827	
02472486	04040062	

#### Drawings:

0007.330-002-012, Sheet 2, Valve Test Logic, Revision 2  
 0007.330-002-184, Schematic Diagram Load Control Unit, Revision 1

#### Miscellaneous

Combined Intercept Valve Parameter Trace, 11/16/2017  
 ECP-14-000677, Disable the NMP U2 EHC Stop Valve Load Limit (SVLL) Logic that renders the turbine Bypass Valves Technical Specification Inoperable, Revision 0  
 ECP-14-000815, EHC Control Cabinet 125 VDC Power Supply Upgrade, Revision 0  
 ECP-17-000531, Temporary Change to Disable Electro Hydraulic Control Stop Valve Load Limit Logic Circuit, Revision 0  
 Stop Valve and Control Valve Parameter Trace, 11/16/2017  
 Unit 2, Control Valve Demand Parameter Trace, 1/1/2014 – 12/31/2016

### **Section 4OA3: Follow-Up of Events and Notices of Enforcement Discretion**

#### Procedures

CNG-CA-1.01-1000, Corrective Action Program, Revision 01101  
 EOP-RPV, RPV Control, Revision 01500  
 N1-EMP-GEN-145, Maintenance of 600V Breakers Type AK-2-15 and Type AK-2-25, Revision 00701  
 N1-EPM-GEN-153, Inspection and Testing of AK-15/25 Breakers and Associated Motors, Revision 00800  
 N1-RCPM-GEN-155, Load Testing of AK and ITE Breaker Trip Devices, Revision 00200  
 N2-ARP-603100, 2CEC\*PNL603 Series 100 Alarm Response Procedures, Revision 00200  
 N2-OSP-RPS-Q001, RPS Turbine Stop Valve Closure Logic Control Valve Fast Closure SCRAM Functional Tests & Turbine Valve Cycling, Revision 00600  
 N2-SOP-21, Turbine Trip, Revision 00800  
 N2-SOP-101C, Reactor SCRAM, Revision 01300  
 PI-AA-125, Corrective Action Program (CAP) Procedure, Revision 006  
 PI-AA-101-1001, Performance Monitoring and Analysis Manual, Revision 0  
 PI-AA-101-1002, PI Management Review Meetings and Reporting, Revision 0  
 PI-AA-125-1003, Corrective Action Program Evaluation Manual, Revision 4

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Drawings:

0007.330-002-012, Sheet 2, Valve Test Logic, Revision 2

0007.330-002-184, Schematic Diagram Load Control Unit, Revision 1

Miscellaneous

Combined Intercept Valve Parameter Trace, 11/16/2017

ECP-14-000677, Disable the NMP U2 EHC Stop Valve Load Limit (SVLL) Logic that renders the turbine Bypass Valves Technical Specification Inoperable, Revision 0

ECP-14-000815, EHC Control Cabinet 125 VDC Power Supply Upgrade, Revision 0

ECP-17-000531, Temporary Change to Disable Electro Hydraulic Control Stop Valve Load Limit Logic Circuit, Revision 0

Stop Valve and Control Valve Parameter Trace, 11/16/2017

Unit 2, Control Valve Demand Parameter Trace, 1/1/2014 – 12/31/2016

**Section 40A7: Licensee-Identified Violations**Procedures:

WC-AA-101-1006, "On-Line Risk Management and Assessment," Revision 001,

Issue Reports:

04064241

**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
CAP	corrective action program
CAPE	corrective action program evaluation
CENG	Constellation Energy Nuclear Group
CR	condition report
CREVS	control room emergency ventilation system
ECCS	emergency core cooling systems
EDG	emergency diesel generator
ESW	emergency service water
FA	fire area
FIN	finding
FW	feedwater
HPCI	high pressure coolant injection
HPCS	high pressure core spray
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IR	issue report
JPM	job performance measure
kV	kilovolt
LCO	limiting condition for operation
LER	licensee event report
LPCI	low pressure coolant injection
LPCS	low pressure core spray
LER	licensee event report
MCPR	minimum critical power ratio
MCR	main control room
NCV	non-cited violation
NMPNS	Nine Mile Point Nuclear Station, LLC
NRC	Nuclear Regulatory Commission, U.S.
PI	performance indicator
RHR	residual heat removal
RPS	reactor protection system
SDP	significance determination process
SSC	system, structure, or component
TB	turbine building
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VAC	volts alternating current
WO	work order