



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

February 1, 2017

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

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2—NRC INTEGRATED  
INSPECTION REPORT 05000373/2016004, 05000374/2016004,  
05000373/2016501 AND 05000374/2016501

Dear Mr. Hanson:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your LaSalle County Station, Units 1 and 2. On January 18, 2017, the NRC inspectors discussed the results of this inspection with Mr. H. Vinyard and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2016, and issuance of this letter closes Inspection Report Number 2016501.

Based on the results of this inspection, the NRC has identified four issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that three violations are associated with these issues. Because the licensee initiated condition reports to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

If you contest the violation(s) 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: (1) the Regional Administrator, Region III; (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) the NRC Resident Inspector at the LaSalle County Station.

In addition, if you disagree with the cross-cutting aspect assignment to any finding 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 Regional Administrator, Region III, and the NRC Resident Inspector at the LaSalle County Station.

B. Hanson

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response, (if any), will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

**/RA/**

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

Docket Nos. 50-373 and 50-374  
License Nos. NPF-11 and NPF-18

Enclosure:  
IR 05000373/2016004; 05000374/2016004;  
05000373/2016501; 05000374/2016501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000373; 05000374  
License Nos: NPF-11; NPF-18

Report Nos: 05000373/2016004; 05000374/2016004;  
05000373/2016501; 05000374/2016501

Licensee: Exelon Generation Company, LLC

Facility: LaSalle County Station, Units 1 and 2

Location: Marseilles, IL

Dates: October 1 through December 31, 2016

Inspectors: R. Ruiz, Senior Resident Inspector  
C. Hunt, Resident Inspector  
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Agency), Resident Inspector

Approved by: K. Stoedter, Chief  
Branch 1  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Report 05000373/2016004, 05000374/2016004, 05000373/2016501 and 05000374/2016501; 10/01/2016 – 12/31/2016; LaSalle County Station, Units 1 & 2; Fire Protection, Identification and Resolution of Problems, and Other Activities.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Four Green findings were identified by the inspectors. Three of the findings involved a Non-Cited Violation (NCV) of the U.S. Nuclear Regulatory Commission (NRC) requirements. The significance of inspection 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," dated July 2016.

### Cornerstone: Mitigating Systems

Green. The inspectors identified a finding of very low safety significance with an associated NCV of the LaSalle County Station Unit 1 and Unit 2 operating licenses, NFP-11, Section 2.C.(25), "Fire Protection Program," and NFP-18, Section 2.C.(15), "Fire Protection Program," respectively, for the licensee's failure to meet the inspection requirements of National Fire Protection Association (NFPA) 10-1975 for portable fire extinguishers. Specifically, from October 10, 2011, to January 9, 2017, the licensee failed to perform inspections on portable fire extinguishers in high radiation areas on the required monthly frequency, including some fire extinguishers that were in place in case of a fire in safety-related areas, such as outside emergency core cooling system pump rooms. The licensee entered this issue into the Corrective Actions Program (CAP) as Action Request (AR) 02739987. Licensee's corrective actions include completion of an evaluation which provided a technical justification for a deviation from the monthly inspection requirements of NFPA-10.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors, including fire, and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, had a fire occurred in one of the affected fire zones containing safety-related mitigation equipment (e.g., RHR pump room) and a licensee responder attempted to use an extinguisher that may not be functional due to an unknown degraded condition allowed to exist because monthly checks were not performed, the fire could progress further and render the mitigating system inoperable. The finding was screened as very low safety significance (Green) because the fire finding was associated with portable fire extinguishers not used for hot work fire watches. The inspectors determined that this finding affected the cross-cutting area of human performance in the aspect of documentation where the organization creates and maintains complete, accurate and up-to-date documentation. Specifically, the licensee failed to ensure that procedures governing the monthly inspection of portable fire extinguishers contained accurate information regarding the use of a deviation from NFPA-10. [IMC 0310, H.7] (Section 1R05)

Green. The inspectors identified a finding of very low safety significance with an associated NCV of Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to provide procedural guidance of a type appropriate to the circumstances. Specifically, licensee procedure MA-AA-716-004, "Conduct of Troubleshooting," Revision 13, did not prescribe appropriate quantitative or qualitative acceptance criteria for determining whether a failed component existed in the 1VY03C control circuit (a safety-related component) using the simple troubleshooting methods outlined by the procedure. The licensee entered this issue into the CAP as ARs 02680921 and 02722425. Corrective actions included revision of the MA-AA-716-004 procedure to include instructions that drove more thorough troubleshooting activities, as recommended by an internal fleet assessment documented in AR 02516457.

The performance deficiency was more than minor, and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected 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, the licensee concluded troubleshooting on fan 1VY03C without correcting the degraded condition which adversely affected the reliability of the fan to automatically start in response to an initiating event. The finding screened as of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of a mitigating system, structure and component (SSC), did not represent a loss of system or function, did not represent an actual loss of function of a train for greater than the TS allowed outage time and did not represent a loss of function of a non-TS train of equipment. The inspectors determined this finding affected the cross-cutting area of problem identification and resolution in the aspect of operating experience where the organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner. Specifically, the licensee failed to ensure evaluation and implementation of internal operating experience in a timely manner after a fleet wide issue concerning less than adequate troubleshooting was entered in the CAP. [IMC 0310 P.5] (Section 4OA2)

Green. A finding of very low safety significance with an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed when the licensee failed to perform preventive maintenance on the Unit 1 reactor core isolation cooling (RCIC) electronic governor-remote (EG-R) actuator. Specifically, from June 4, 1993, to November 17, 2016, the licensee's processes for the control and administration of preventive maintenance failed to ensure that the Unit 1 RCIC EG-R actuator was replaced or refurbished on an interval that would prevent internal fouling of the EG-R actuator from adversely affecting governor performance. As a result, contaminants and degradation accumulated in the EG-R actuator from January 16, 2004, to November 17, 2016, ultimately causing the RCIC turbine to trip during quarterly surveillance testing on October 18, 2016, and again on November 17, 2016. The licensee entered this issue into the CAP as ARs 02729757 and 02742254. Corrective actions planned and completed included replacing the Unit 1 and Unit 2 RCIC EG-Rs and performing a root cause evaluation of the degraded condition.

The performance deficiency was more than minor, and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected 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, the failure to perform preventive maintenance on the Unit 1 RCIC EG-R resulted in a degraded condition which adversely affected the reliability of the system to respond to an initiating event. A detailed risk evaluation determined that the finding screened as having very low safety significance (Green). This finding did not have a cross-cutting aspect because the performance deficiency was not indicative of current licensee performance. (Section 4OA2)

Green. The inspectors identified a finding of very-low safety significance when licensee personnel failed to ensure that the design inputs used in block wall evaluations for determination of their seismic capacities were consistent with the conditions as built or as specified in the design documents. Specifically, the material properties and wall configurations used in the analyses were not consistent with the as-built conditions. The evaluations were a part of the licensee's response to the NRC Request for Information Pursuant to 10 CFR, Part 50.54(f) regarding Recommendation 2.1: Seismic, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident. The performance deficiency did not impact the operability or functionality of the walls and was captured in the licensee's CAP under ARs 2712569, 2711669, 2711877, 2710850, 2711337 and 2711875, with actions to revise the affected calculations.

The performance deficiency was more than minor, and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to determine and use correct design inputs adversely impacted the evaluations of block walls required for protection of the components attached to or located in proximity of the walls, and needed to support implementation of the diverse and flexible coping strategies. The finding screened as having very-low safety significance (Green) because the finding did not result in the loss of operability or functionality of any affected structures, systems, and components. The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of field presence where senior managers ensure supervisory and management oversight of work activities, including contractors and supplemental personnel. Specifically, the licensee failed to provide supervisory and management oversight for the activities of the contractor performing the block wall evaluations. [IMC 0310, H.2] (Section 4OA5)

## **REPORT DETAILS**

### **Summary of Plant Status**

#### **Unit 1**

The unit began the inspection period operating at full power. On December 2, 2016, power was reduced to approximately 80 percent to perform maintenance on a degraded turbine control valve linear variable differential transformer. The issue was repaired and the unit returned to full power that day. On December 17, 2016, power was reduced to approximately 73 percent to perform a control rod sequence exchange as well as rod control system and turbine surveillance testing. The unit returned to full power on December 18, 2016.

#### **Unit 2**

The unit began the inspection period operating at full power. On October 29, 2016, power was reduced to approximately 81 percent to perform a control rod sequence exchange. The unit returned to full power on October 30, 2016. On December 10, 2016, power was lowered to approximately 76 percent to perform a control rod sequence exchange as well as rod control system surveillance testing. The unit returned to full power on December 11, 2016. On December 31, 2016, power was lowered to approximately 78 percent to perform maintenance on the 1A turbine driven reactor feed pump feed controller. The issue was resolved and the unit returned to full power later that day.

### **1. REACTOR SAFETY**

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

#### **1R04 Equipment Alignment (71111.04)**

##### **.1 Quarterly Partial System Walkdowns**

##### **a. Inspection Scope**

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Unit 1 reactor core isolation cooling (RCIC);
- Unit 1 high pressure core spray (HPCS);
- Unit 1 standby gas treatment;
- Unit 1B emergency diesel generator (DG); and
- Unit 0 (common) emergency DG.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of



performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted five partial system walkdown samples as defined in Inspection Procedure (IP) 71111.04–05.

b. Findings

No findings were identified.

.2 Semiannual Complete System Walkdown

a. Inspection Scope

On November 2, 2016, the inspectors performed a complete system alignment inspection of the Unit 1 standby liquid control system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05AQ)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- fire zone 3I2 reactor building elevation 673'4", Unit 1 HPCS cubicle;
- fire zone 2H3 reactor building elevation 694'6", Unit 1 residual heat removal (RHR) heat exchanger B cubicle;
- fire zone 3B1 reactor building elevation 820'6", Unit 2 general area and standby gas treatment area;
- fire zone 2B1 reactor building elevation 820'6", Unit 1 general area and standby gas treatment area.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted four quarterly fire protection inspection samples as defined in IP 71111.05AQ-05.

b. Findings

Failure to Perform Required Monthly Fire Extinguisher Inspections per National Fire Protection Association Code

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of LaSalle County Station Unit 1 and Unit 2 operating licenses, NFP-11 and NFP-18, respectively, for failing to ensure that the inspection requirements of the National Fire Protection Association (NFPA) Code No. 10 for portable fire extinguishers were satisfied. Specifically, from October 10, 2011, to January 9, 2017, the licensee failed to perform inspections on portable fire extinguishers in high radiation areas at the required monthly frequency.

Description: On October 7, 2016, the inspectors reviewed licensee procedure LMS-FP-21, "Monthly Inspection of Portable Fire Extinguishers," as part of a routine fire protection walkdown sample. Section D.3 of LMS-FP-21 stated, in part, that extinguishers which are inaccessible due to high radiation in the area are not required to be checked at the monthly frequency specified by the procedure. Further, the procedure stated that those fire extinguishers which are marked with an asterisk in the procedure are in high radiation areas and shall be inspected on a 24-month cycle as a minimum. The procedure referenced AR 1190691-02 for more details.

Action Request 1190691-02 documented a design engineering review of design basis documents and regulations to determine if either fire extinguishers in high radiation areas could be moved, or if the monthly check of fire extinguishers, as outlined in LMS-FP-21, could be considered not applicable for those extinguishers in high radiation or locked high radiation areas. The goal of the licensee's review was to further reduce the radiation dose associated with performing the monthly checks to as-low-as-reasonably-achievable (ALARA). Action Request 1190691-02 stated, in part, that the site already had a deviation from NFPA 10-1975 in the LaSalle Station Fire Protection Report that allowed for extinguishers in high radiation areas to be inspected on a 24-month schedule. The review recommended that LMS-FP-21 be revised to clearly take advantage of the deviation that already existed in the LaSalle Station Fire Protection Report and that the extinguishers in high radiation areas could be inspected on a 24-month schedule. The licensee included the recommendation in the next revision of LMS-FP-2, dated October 10, 2011. The inspectors reviewed the LaSalle Station Fire Protection Report, Revision 7, "NFPA Code Deviation Summary Matrix". The deviation referenced in AR 119061-02 was Deviation 10-7, which stated, in part, that extinguishers in high radiation areas were inspected on a 24-month schedule and that this was an acceptable deviation to ensure personnel exposure was maintained "ALARA." The inspectors noted that the deviation in question specifically applied to Section 4-4.1 of NFPA 10-1975.

NFPA 10-1975, Section 4-2.1, defined the term "Inspection" as a "quick check" that an extinguisher was available and would operate. It was intended to give reasonable assurance that the extinguisher was fully charged and operable. This was done by verifying that it was in the designated place, that it had not been actuated or tampered with, and that there was no obvious physical damage or condition to prevent operation. Additionally, Section 4-2.1 defined the term "Maintenance" as a "thorough check" of the extinguisher. It was intended to give maximum assurance that an extinguisher would operate effectively and safely. It included a thorough examination of the portable fire extinguishers and any necessary repair or replacement. Maintenance would normally reveal the need for hydrostatic testing.

Deviation 10-7 applied to Section 4-4.1 of NFPA 10-1975, which specifically referred to maintenance of portable fire extinguishers, or the "thorough check" as defined earlier. Section 4-4.1 stated, in part, that extinguishers shall be subjected to maintenance not more than one year apart or when specifically indicated by an inspection. Licensee procedure LMS-FP-05, "Annual Inspection, Maintenance, and Weight Check of Portable Fire Extinguishers", provided guidance on the annual inspection of portable fire extinguishers.

Deviation 10-7 did not apply to Section 4-3.1 of NFPA 10-1975 which referred to the monthly inspections of portable fire extinguishers, or the "quick check" as defined earlier. NFPA 10-1975, Section 4-3.1, stated, in part, that portable fire extinguishers be inspected monthly, or at more frequent intervals when circumstance required. Licensee procedure LMS-FP-21 provided guidance on monthly portable fire extinguisher inspections.

The inspectors determined that licensee procedure LMS-FP-21 improperly applied Deviation 10-7 for the annual maintenance of portable fire extinguishers to the monthly inspection of portable fire extinguishers at the site, allowing a maximum of 24 months between inspections.

Analysis: The failure to meet the inspection requirements of NFPA 10–1975 for portable fire extinguishers was a performance deficiency. Specifically, from October 10, 2011, to January 9, 2017, the licensee failed to perform inspections on portable fire extinguishers in high radiation areas on the required monthly frequency, including some fire extinguishers that were in place in case of a fire in safety-related areas, such as outside emergency core cooling systems rooms. The performance deficiency was determined to be more than minor because it is associated with the Mitigating Systems cornerstone attribute of protection against external factors, including fire, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, had a fire occurred in one of the affected fire zones containing safety-related mitigation equipment (e.g., RHR pump room) and a licensee responder attempted to use an extinguisher that might not be functional due to an unknown degraded condition allowed to exist because monthly checks were not performed, the fire could progress further and render the mitigating system inoperable.

The inspectors evaluated the finding in accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Initial Characterization of Findings,” issued on October 7, 2016. Using IMC 0609, Appendix F, “Fire Protection Significance Determination Process,” issued September 20, 2013, Attachment 1, “Fire Protection Significance Determination Worksheet,” the finding screened as of very low safety significance (Green) because the inspectors answered “Yes” to question 1.4.6 A, “Is the fire finding associated with portable fire extinguishers not used for hot work fire watches?”

The inspectors determined that this finding affected the cross-cutting area of human performance in the aspect of documentation where the organization creates and maintains complete, accurate and up-to-date documentation. Specifically, the licensee failed to ensure that procedures governing the monthly inspection of portable fire extinguishers contained accurate information regarding the use of a deviation from NFPA 10 [H.7].

Enforcement: The LaSalle County Station Unit 1 and Unit 2 operating licenses, NFP–11, Section 2.C.(25), “Fire Protection Program”, and NFP–18, Section 2.C.(15), “Fire Protection Program”, require in part, that the licensee implement and maintain all provisions of the approved Fire Protection Program as described in the site’s UFSAR. The UFSAR references the LaSalle County Station Fire Protection Report, which states that the code of record for portable fire extinguishers for LaSalle County Station is NFPA 10–1975. NFPA 10–1975, Section 4–3.1, “Frequency,” states, in part, that extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require.

Contrary to the above, from October 10, 2011, to January 9, 2017, the licensee failed to ensure that the inspection requirements of NFPA 10 for portable fire extinguishers were satisfied. Specifically, the licensee failed to perform inspections of portable fire extinguishers in high radiation areas on the required monthly frequency because the licensee improperly applied a deviation from the maintenance requirements of NFPA 10 to the inspection requirements of NFPA 10 at the site.

The licensee documented this issue in AR 02739987, which included corrective actions to reword Deviation 10–7 to explicitly state that it only applied to the maintenance of portable fire extinguishers and to perform an evaluation to determine if a new deviation could be taken from the monthly inspection requirement of NFPA 10.

Because this violation was of very low safety significance and was entered into the licensee's CAP as AR 02739987, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy.

**(NCV 05000373/05000374/2016004–01, Failure to Perform Required Monthly Fire Extinguisher Inspections per National Fire Protection Association Code)**

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's CAP documents with respect to past flood-related items identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Unit 2 HPCS pump cubicle.

Documents reviewed are listed in the Attachment to this report. This inspection constituted one internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification (71111.11Q)

a. Inspection Scope

On October 25, 2016, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program simulator sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On October 23, 2016, the inspectors observed operators in the control room performing multiple surveillances during deep backshift hours. The activities performed required heightened awareness or were related to increased risk. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms (if applicable);
- correct use and implementation of procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications (if applicable).

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.3 Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspector reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from July 27 – August 28, 2016, as required by Title 10 of the *Code of Federal Regulations* (CFR), Section 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training Program to meet the requirements of 10 CFR 55.59.

This inspection constituted one annual licensed operator requalification inspection sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

The inspectors evaluated the following process and degraded performance issues involving risk-significant systems:

- Maintenance Rule (a)(3) evaluation;
- standby liquid control system; and
- Unit 1 core standby cooling system equipment room ventilation system.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for systems, structures, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three quarterly maintenance effectiveness as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unit 1 reactor core isolation cooling (RCIC) low pressure suction trip of 10/18/2016;
- Unit 1 RCIC low pressure suction trip of 11/17/2016;
- Line 0104 and 1A RHR work window coordination; and
- Division III outage for HPCS and 125 volts direct current (VDC) battery charger work.

These activities were selected based on their potential risk significance relative to the Reactor Safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Documents reviewed are listed in the Attachment to this report.

These maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:



- Unit 0 diesel generator (DG) AC circulation oil pump coupling failure;
- multiple cracks found in battery cells of 2DC18E;
- Unit 0 DG TS applicability to LPCS;
- Unit 2 loss of rod position indication control rod 34–27 restoration; and
- operability evaluation 16-005 partial length rod burnup.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that 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 TS and the UFSAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of CAP documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted five samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the Flex 480V switchgear permanent modification. The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected systems. The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one permanent plant modification sample as defined in IP 71111.18–05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Train B/C RHR water leg pump satisfactory operation;
- RCIC post-maintenance testing following troubleshooting; and
- Unit 2 Division III 235 VDC battery restoration.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed CAP documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activity to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Unit 1 RCIC cold quick restart

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one routine surveillance testing sample as defined in IP 71111.22–05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The regional inspectors performed an in-office review of the latest revisions to the Emergency Plan and Emergency Action Levels (EALs).

The licensee transmitted the Emergency Plan and EAL revisions to the U.S. Nuclear Regulatory Commission pursuant to the requirements of Title 10 of the CFR, Part 50, Appendix E, Section V, “Implementing Procedures.” The U.S. Nuclear Regulatory Commission review was not documented in a Safety Evaluation Report, and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

This EAL and Emergency Plan Changes inspection constituted one sample as defined in IP 71114.04–05.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors reviewed select radiation work permits used to access high radiation areas and evaluated the specified work control instructions or control barriers. The inspectors also assessed whether workers were made aware of the work instructions and area dose rates.

The inspectors reviewed electronic alarming dosimeter dose and dose rate alarm setpoint methodology. For selected electronic alarming dosimeter occurrences, the inspectors assessed the worker's response to the alarm, the licensee's evaluation of the alarm, and any followup investigations.

The inspectors reviewed the licensee's methods for informing workers of changes in plant operations or radiological conditions that could significantly impact their occupational dose.

The inspectors reviewed the labeling of select containers of licensed radioactive material that could cause unplanned or inadvertent exposure to workers.

These inspection activities supplemented those documented in Inspection Report (IR) 05000373/2016001; 05000374/2016001 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.2 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors material leaving the radiologically controlled area and assessed the methods used for control, survey, and release of material from these areas. As available, the inspectors observed health physics personnel surveying and releasing material for unrestricted use.

The inspectors observed workers leaving the radiologically controlled area and assessed their use of tool and personal contamination monitors and reviewed the licensee's criteria for use of the monitors.

The inspectors assessed whether instrumentation was used at its typical sensitivity levels based on appropriate counting parameters or whether the licensee had established a de facto release limit.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact. The inspectors also evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

These inspection activities supplemented those documented in IR 05000373/2016001; 05000374/2016001 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.3 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated the licensee's use of electronic alarming dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed a NRC approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in work areas with significant dose rate gradients.

For select airborne area radiation work permits, the inspectors reviewed airborne radioactivity controls and monitoring, the potential for significant airborne levels, containment barrier integrity, and temporary filtered ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials stored within pools and assessed whether appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

These inspection activities supplemented those documented in IR 05000373/2016001; 05000374/2016001 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.08)

a. Inspection Scope

The inspectors assessed whether problems associated with radiological hazard assessment and exposure controls were being identified at an appropriate threshold and were properly addressed for resolution. For select problems, the inspectors assessed the appropriateness of the corrective actions. The inspectors also assessed the licensee's program for reviewing and incorporating operating experience.

The inspectors reviewed select problems related to human performance errors and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

The inspectors reviewed select problems related to radiation protection technician error and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

These inspection activities supplemented those documented in IR 05000373/2016001; 05000374/2016001 and constituted one complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

.1 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors evaluated whether post-job reviews were conducted to identify lessons learned and entered into the licensee's CAP.

These inspection activities supplemented those documented in IR 05000373/2016001; 05000374/2016001 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.2 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors reviewed the assumptions and bases in ALARA work planning documents for selected activities and verified that the licensee has established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities.

The inspectors reviewed selected occasions with inconsistent or incongruent results from the licensee's intended radiological outcomes to determine whether the cause was attributed to a failure to adequately plan work activities, or failure to provide sufficient management oversight of in-plant work activities, or failure to conduct the work activity without significant rework, or failure to implement radiological controls as planned.

These inspection activities supplemented those documented in IR 05000373/2016001; 05000374/2016001 and constituted a partial sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for Units 1 and 2 from the fourth quarter 2015 through the third quarter 2016. To determine the accuracy of the performance indicator (PI) data reported, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, and NUREG–1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC Integrated IRs for the fourth quarter 2015 through the third quarter 2016 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two safety system functional failures samples as defined in IP 71151–05.

b. Findings

No findings were identified.

## .2 Mitigating Systems Performance Index—Heat Removal System

### a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI)—Heat Removal System performance indicator for Units 1 and 2 from the third quarter 2015 through the third quarter 2016. To determine the accuracy of the PI data reported, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC integrated IRs from the third quarter 2015 through the third quarter 2016 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI heat removal system samples as defined in IP 71151-05.

### b. Findings

No findings were identified.

## .3 Mitigating Systems Performance Index—Cooling Water Systems

### a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index—Cooling Water Systems performance indicator for Units 1 and 2 from the third quarter 2015 through the third quarter 2016. To determine the accuracy of the PI data reported, PI definitions and guidance contained in the NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated IRs from the third quarter 2015 through the third quarter 2016 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI cooling water system samples as defined in IP 71151-05.

### b. Findings

No findings were identified.



## 4OA2 Identification and Resolution of Problems (71152)

### .1 Routine Review of Items Entered into the Corrective Action Program

#### a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's CAP at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's CAP as a result of the inspectors' observations; however, they are not discussed in this report.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter.

#### b. Findings

No findings were identified.

### .2 Semiannual Trend Review

#### a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of July 1, 2016, through December 31, 2016, although some examples expanded beyond those dates where the scope of the trend warranted. As part of this review, the inspectors also performed focused CAP text string searches for the following terms: troubleshoot; rework; inadequate; and unacceptable.

The review also included issues documented outside the CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted one semi-annual trend review inspection sample as defined in IP 71152.

b. Observations

As part of this review, the inspectors focused on the site's performance of troubleshooting equipment issues over the selected six month timeframe. Specifically, the inspectors reviewed instances where a system or component were declared inoperable due to an unexpected issue, underwent troubleshooting, were declared operable, and then subsequently declared inoperable due to the same issue. The inspectors noted that in two separate cases, the low suction trip of the Unit 1 RCIC turbine during surveillance testing and the failure of the 1B and 1C RHR pump room cubical cooler fan 1VY03C to start as required during surveillance testing, the licensee missed opportunities to discover the failed component resulting in additional system failures during subsequent surveillance testing. The RCIC turbine trip is discussed later in this section. The 1VY03C fan failure to start as expected is discussed below.

c. Findings

Failure to Provide Sufficient Guidance for the Successful Troubleshooting of Safety-Related Equipment

Introduction: The inspectors identified a Green finding and an associated Non-Cited-Violation (NCV) for the licensee's failure to provide procedural guidance of a type appropriate to the circumstances for an activity affecting quality. Specifically, licensee procedure MA-AA-716-004, "Conduct of Troubleshooting," Revision 13, did not prescribe appropriate quantitative or qualitative acceptance criteria for determining whether a failed component existed in the 1VY03C control circuit during troubleshooting following the failure of fan 1VY03C to automatically start during quarterly surveillance testing of the 1B RHR pump. As a result, fan 1VY03C, again, failed to start during the subsequent quarterly surveillance test.

Description: On July 8, 2016, while the licensee performed LOS-RH-Q1, "RHR (LPCI) and RHR Service Water Pump and Valve Inservice Test for Modes 1,2,3,4 and 5," the 1VY03C cubicle cooler fan failed to automatically start as expected. The 1VY03C fan provides room cooling for the 1B and 1C RHR pump room to support operability. During normal operation, an auxiliary contact in the fan circuitry closes when a signal is received from the mechanism operated contact (MOC) switch on the 1B RHR breaker when the 1B RHR breaker is shut. When this auxiliary contact closes, power is available to the 1VY03C fan and it automatically starts. The licensee declared both 1B and 1C RHR pumps inoperable. The 1VY03C fan was able to be started manually by equipment operators at the local control switch.

The licensee performed troubleshooting in accordance with MA-AA-716-004, "Conduct of Troubleshooting," Revision 13. During troubleshooting, the licensee discovered that the wire connection at terminal block TB-29 from the control switch was one and one-half turns loose. After performing resistance checks and visual checks on the 1VY03C control circuitry, including visually checking the alignment and condition of the MOC switch in the 1B RHR circuit breaker cubicle, the licensee determined that the loose wire connection was the suspected cause of the fan failing to automatically start and discontinued the remainder of the steps in the troubleshooting plan. The steps that were discontinued would have tested the operation of the 1VY03C auxiliary contacts with the 1B RHR breaker in a rack-to-test position.

The licensee tightened the loose connection but took no additional steps to confirm that the loose wire was the cause of the failure. The licensee made no further effort to determine if any other failure modes existed that would have prevented the fan from operating as designed.

Later, on July 8, 2016, after a successful post-maintenance test on the system, including the fan automatically starting as required, the licensee declared 1B and 1C RHR pumps operable. The licensee initiated an apparent cause evaluation of the event but later downgraded the causal evaluation to a work group evaluation stating that the problem was immediately located during troubleshooting and the issue was determined to be an isolated event. The licensee reviewed past work packages performed on the system and did not identify any work that would have caused the suspected wire to become loose.

On September 30, 2016, the licensee performed LOS–RH–Q1 and again the 1VY03C fan failed to automatically start as required. The licensee declared the 1B and 1C RHR pumps inoperable and again noted that the fan could be started manually from the local control switch. The licensee performed troubleshooting in accordance with procedure MA–AA–716–004 and replaced the motor contactor “M” coil for the fan and the MOC switch on the 1B RHR breaker. On October 1, 2016, after a successful post-maintenance test, the licensee declared the 1B and 1C RHR pumps operable. The licensee initiated an apparent cause evaluation for the event. The licensee ruled out the “M” coil as being the cause of the failure and the MOC switch was sent to an offsite lab for forensic analysis. The result of the analysis was that mechanical wear and carbon build-up in the MOC switch resulted in a condition where the MOC switch contacts would not consistently close with good continuity. This condition caused the MOC switch to operate intermittently and prevented the switch from sending a reliable signal to the 1VY03C auxiliary contacts to close.

During a review of the issue, the inspectors interviewed personnel involved with developing the troubleshooting plans for both events. The individuals indicated that the troubleshooting plans were developed under “simple troubleshooting” as defined in procedure MA–AA–716–004, and did not require the workers to continue to search for other potential failure mechanisms in the system after the loose wire was found during the July 8, 2016, event. The inspectors reviewed procedure MA–AA–716–004 and determined that the procedure gave specific guidance for closing out a “complex troubleshooting” plan, as defined by the procedure, but it did not provide similar guidance for closing out a simple troubleshooting plan. Specifically, the procedure stated, in part, that for complex troubleshooting, determining both the failed component and failure modes should be done with high confidence to minimize the risk of repeat failures. To document closure of a complex troubleshooting plan with high confidence, the evaluator should demonstrate that all physical evidence both supports the defined failed component and failure mode and also refuted the other potential failures. The inspectors also reviewed licensee CAP document Action Request (AR) 02516457, “Less Than Adequate Fleet Troubleshooting,” written by the Exelon corporate office. The document highlighted performance gaps in Exelon fleet troubleshooting that were identified by an internal fleet assessment and created some corrective actions to track the closure of those gaps. One of the gaps identified was that the troubleshooting procedure was not written clearly enough to develop and consistently execute adequate troubleshooting to determine accurate component failure causes.

The fleet assessment recommended that corporate engineering revise procedure MA-AA-716-004. Some of those recommended changes included, in part: clearly allowing the use of advanced troubleshooting tools without declaring the troubleshooting complex in nature; clearly delineating the requirements to closeout all failure modes identified; and clearly delineating the situational need to execute advanced troubleshooting tools to a subcomponent level necessary to support effective troubleshooting plan development.

The inspectors noted that the fleet operating experience discussed in AR 02516457 was documented on June 18, 2015, and was available to the licensee before the first failure of fan 1VY03C. Procedure MA-AA-716-004, Revision 14, which incorporated the procedural improvements listed in AR 02516457, was not issued until October 12, 2016. The licensee has since implemented MA-AA-716-004, Revision 14, which provides guidance for determining a failed component in a system during simple troubleshooting, with higher confidence.

Analysis: The failure of procedure MA-AA-716-004, Revision 13 (an activity affecting quality) to provide guidance of a type appropriate to the circumstances, is not in accordance with the requirements of 10 CFR 50, Appendix B, Criterion V, and is a performance deficiency. Specifically, the failure to instruct the development and execution of a troubleshooting plan capable of identifying a failed component in a safety-related system was a performance deficiency. Using guidance in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor, and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee concluded troubleshooting activities on fan 1VY03C without identifying and correcting the degraded condition that caused its failure, and adversely affected the reliability of the fan to automatically start in response to an initiating event. The inspectors evaluated the finding using the significance determination process in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power", Exhibit 2, dated June 19, 2012. The finding screened as of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of a mitigating system, structure and component (SSC), did not represent a loss of system or function, did not represent an actual loss of function of a train for greater than the technical specification (TS) allowed outage time and did not represent a loss of function of a non-TS train of equipment. Specifically, because the 1VY03C fan was able to be operated in manual mode it was still considered available for use during an event.

The inspectors determined this finding affected the cross-cutting area of problem identification and resolution in the aspect of operating experience where the organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner. Specifically, the licensee failed to ensure evaluation and implementation of internal operating experience in a timely manner after a fleet wide issue concerning less than adequate troubleshooting was entered in the CAP [P.5].

Enforcement: Title 10 of the CFR, Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” states that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstance and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that activities have been satisfactorily accomplished.

Contrary to the above, on July 8, 2016, the licensee procedure MA-AA-716-004, “Conduct of Troubleshooting,” Revision 13, did not prescribe appropriate quantitative or qualitative acceptance criteria for determining whether the failed component in the 1VY03C control circuit was successfully found using the simple troubleshooting methods outlined by the procedure. The licensee has revised procedure MA-AA-716-004 to include the procedural improvements identified in AR 02516457, “Less than Adequate Fleet Troubleshooting.” Because this violation was of very low safety significance and the issue was entered in into the licensee’s CAP as ARs 02680921 and 02722425, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000373/05000374/2016004-02, Failure to Provide Sufficient Guidance for the Successful Troubleshooting of Safety-Related Equipment)**

.3 Annual Followup of Selected Issues: RCIC Low Suction Pressure Trips

a. Inspection Scope

The inspectors performed a review of the licensee’s CAP and associated documents, specifically, AR 02729757, “U-1 RCIC Trip on Low Suction Pressure,” and AR 02742254, “U1 RCIC Trip on Low Suction Pressure.” The inspectors interviewed personnel, performed walkdowns, attended briefings, observed post-maintenance testing, and verified the completion of and assessed the adequacy of the corrective actions taken in response to a Unit 1 RCIC turbine trip on low suction pressure on October 18, 2016, and again on November 17, 2016.

The inspector’s review and evaluation was focused on the licensee’s corrective actions to ensure that: complete and accurate identification of the problem was done in a timely manner; consideration of the extent of condition, generic implications, common cause, and previous occurrences was taken; the licensee classified and prioritized the resolution of the problem commensurate with safety significance; the root and contributing causes of the problem were identified; corrective actions were identified and were appropriately focused to correct the problem; corrective actions were completed in a timely manner; corrective actions were effective to preclude repetition; operating experience was adequately evaluated for applicability; and applicable lessons learned were communicated to appropriate organizations.

This review constituted one in-depth problem identification and resolution inspection sample as defined in IP 71152-05.

b. Background

On October 18, 2016, during the performance of a quarterly surveillance test on the Unit 1 RCIC system, the RCIC turbine tripped shortly after start up on low suction pressure. The licensee performed troubleshooting on the system and ultimately declared the system operable after a successful post-maintenance test

on October 20, 2016. Approximately one month later, on November 17, 2016, while performing the same quarterly surveillance test, the RCIC turbine again tripped on low suction. After troubleshooting the issue a second time, the licensee discovered that the RCIC turbine governor system was degraded due to internal fouling from contaminants in the governor control oil system.

c. Findings

Failure to Perform Preventive Maintenance Resulting in Two Subsequent Unit 1 RCIC Turbine Trips during Surveillance Testing

Introduction: A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed for the licensee's failure to ensure that activities affecting quality for the safety-related RCIC system were prescribed in a manner appropriate to the circumstances. Specifically, the licensee's processes for the control and administration of preventive maintenance failed to ensure that the Unit 1 RCIC EG-R actuator was replaced or refurbished on an interval that would prevent internal fouling of the EG-R actuator from adversely affecting governor performance. Fouling of the EG-R actuator caused a trip of the Unit 1 RCIC turbine during startup on October 18, 2016, and again on November 17, 2016.

Description: On October 18, 2016, while performing the Unit 1 RCIC system quarterly surveillance test, LOS-RI-Q5, "Reactor Core Isolation System Pump Operability, Valve Inservice Tests in Modes 1, 2, 3 and Cold Quick Restart", the RCIC turbine tripped on low suction pressure approximately seven seconds after startup. The licensee declared the system inoperable and focused troubleshooting efforts on parts of the system that were most affected by maintenance activities performed in the previous system maintenance window. The licensee was unable to determine the reason for the trip during troubleshooting but replaced two components that were thought to be the most likely source of the trip. Following troubleshooting and a successful run of the system, the licensee declared the system operable on October 20, 2016.

On November 17, 2016, while attempting to perform surveillance LOS-RI-Q5, the RCIC turbine again tripped on low suction pressure approximately eight seconds after startup. The licensee declared the system inoperable and troubleshooting for the second turbine trip revealed that contaminants in the governor control oil system had fouled the turbine EG-R actuator. The EG-R actuator is the part of the turbine governor that converts electrical signals from the turbine's speed sensing circuitry into hydraulic pressure used to adjust the position of the turbine governor valve and ultimately the speed of the turbine. The fouling in the EG-R actuator slowed the governor's response to dampen the initial speed ramp of the turbine during the system quick start resulting in turbine suction pressure dropping below the low pressure trip set point. The licensee replaced the EG-R actuator and performed LIS-RI-115, "Unit 1 RCIC Control System Calibration," to calibrate the turbine governor control system. After a successful calibration and post-maintenance run of the system, the licensee declared the system operable on November 20, 2016.

The inspectors reviewed the operating history of the Unit 1 RCIC system and noted that a similar problem had occurred on Unit 1 in 1990. On June 18, 1990, during fast start testing, the Unit 1 RCIC turbine tripped on overspeed. The licensee's investigation included the removal and inspection of the EG-R actuator. The licensee found sediment

inside the actuator and on the actuator's components. This event was the subject of NRC Information Notice 86-14, Supplement 2, "Overspeed Trips of AFW, HPCI, and RCIC". To prevent the problem from recurring, the licensee's corrective actions included requiring oil to be filtered before filling the turbine lube oil system and creating a preventive maintenance task for flushing the oil system and disassembling, inspecting, and cleaning the EG-R actuator during each outage.

On April 8, 1991, during the 1LR04 refueling outage, the Unit 1 EG-R actuator was removed from the system, inspected, cleaned, and reinstalled.

On June 4, 1993, the licensee deleted the preventive maintenance task for flushing the oil system and disassembling, inspecting, and cleaning the EG-R actuator from their preventive maintenance program based on a recommendation by General Electric. General Electric recommended that the licensee discontinue periodic disassembly and cleaning of the EG-R due to the licensee's knowledge of the task being too limited and disassembly of the EG-R actuator could damage it. The licensee determined that instead of disassembling the EG-R actuator to inspect and clean it, the EG-R actuator would be replaced at five year intervals. The licensee incorporated instructions on replacing the EG-R actuator into the turbine overhaul procedure LMP-RI-02, "Reactor Core Isolation Cooling Turbine Maintenance", Revision 2, on January 31, 1996, but established no specific preventive maintenance task for the replacement of the EG-R.

On August 19, 1999, the licensee changed the frequency of performing LMP-RI-02 from every five years to every six years.

On October 27, 1999, the Unit 1 RCIC EG-R actuator was replaced during the Unit 1 turbine overhaul in accordance with LMP-RI-02.

On December 1, 2001, the licensee changed the frequency of LMP-RI-02 from every six years to every three outages, approximately six years, to allow the work to be done offline in order to reduce unavailability for the Unit 1 RCIC system.

On May 1, 2002, the licensee changed the frequency of LMP-RI-02 from every three outages to every four outages, approximately every eight years. The licensee cited the reason for the change was based on history and a revision to the corporate performance-centered maintenance template which allowed the frequency to be extended from six to eight years.

On January 18, 2004, the licensee changed out the EG-R actuator on the Unit 1 RCIC turbine in support of a root cause corrective action associated with an unrelated event concerning water hammer in the system that occurred on September 8, 2003.

On May 31, 2006, the licensee changed the frequency of LMP-RI-02 from every four outages to every six outages, approximately every 12 years. The licensee cited the reason for the change as based on history and that engineering deemed the change acceptable.

The inspectors noted that greater than 12 years had elapsed from January 18, 2004, the last time the Unit 1 RCIC EG-R actuator was replaced, to November 17, 2016, where fouling was identified in the EG-R actuator after the second Unit 1 RCIC turbine trip.

Since June 4, 1993, the licensee did not have a formal preventive maintenance schedule specific to the EG-R actuator directing its replacement on an interval that would prevent fouling similar to that which occurred on June 18, 1990. Guidance for replacing the EG-R actuator was contained in the RCIC turbine overhaul procedure, LMP-RI-02; however, the licensee changed the frequency of LMP-RI-02 on four separate occasions without analyzing the effects that these changes would have on the material conditions of the EG-R actuator. Licensee's corrective actions included replacing both Unit 1 and Unit 2 RCIC turbine EG-R actuators and performing a root cause analysis of the degraded condition.

Analysis: The failure to perform preventive maintenance on the Unit 1 RCIC EG-R actuator on an interval that would prevent internal fouling from adversely affecting system operability was not in accordance with the requirements of 10 CFR 50, Appendix B, Criterion V, and is a performance deficiency. Using guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor, and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform preventive maintenance on the Unit 1 RCIC EG-R resulted in a degraded condition which adversely affected the reliability of the system to respond to an initiating event. The inspectors evaluated the finding using the significance determination process in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, dated June 19, 2012. The inspectors reviewed the Mitigating Systems screening questions in Exhibit 2 and answered "No" to question A.1, "If the finding is deficiency affecting the design or qualification of a mitigating SSC, does the SSC maintain its operability or functionality". The inspectors answered "Yes" to question A.2, "Does the finding represent a loss of system and/or function". Therefore, a detailed risk evaluation was required.

A RIII Senior Reactor Analyst performed a detailed risk evaluation of the finding using the LaSalle Standardized Plant Analysis Risk Model, Version 8.24. The RCIC system was last successfully operated on August 27, 2016, before it tripped on October 18, 2016, and again on November 17, 2016. The system was repaired and returned to service on November 20, 2016. The total period of time where RCIC function was impacted by the internal fouling of the actuator was determined to be 85 days. The successful start of RCIC in between the two failure-to-start events with no corrective action for the fouling indicates that the low suction pressure trip was recoverable. The senior reactor analyst modeled the RCIC system as a recoverable failure to start over an 80-day exposure period and a non-recoverable failure to start over a 5-day exposure period for the period of time that RCIC was removed from service in October and November for repair. The delta core damage frequency was determined to be less than  $1\text{E}-7/\text{yr.}$ , which is a finding of very low safety significance (Green). The dominant core damage sequence was a loss of main feedwater followed by the failure of RCIC due to the performance deficiency, failure of the high pressure core spray (HPCS) system, and the failure to depressurize and use low pressure systems for core cooling.

There is no cross-cutting aspect assigned to this performance deficiency because this performance deficiency is not indicative of current licensee performance.



**Enforcement:** Title 10 of the 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, of a type appropriate to the circumstance and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, from June 4, 1993, to November 17, 2016, the licensee failed to prescribe activities affecting quality of a type appropriate to the circumstances for governing the preventive maintenance of the Unit 1 RCIC EG–R actuator, a safety-related component. Specifically, the licensee’s processes for the control and administration of preventive maintenance failed to ensure that the Unit 1 RCIC EG–R actuator was replaced or refurbished on an interval that would prevent internal fouling of the EG–R actuator from adversely affecting system operability. As a result, contaminants accumulated in the EG–R actuator from January 16, 2004, to November 17, 2016, ultimately causing the RCIC turbine to trip on low suction during quarterly surveillance testing on October 18, 2016, and again on November 17, 2016.

At the time of this report, the licensee is completing a root cause evaluation of this issue to prevent repetition. Because this violation was of very low safety significance and the issue was entered in into the licensee’s CAP as ARs 02729757 and 02742254, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000373/2016004–03, Failure to Perform Preventive Maintenance Resulting in Two Subsequent Unit 1 RCIC Turbine Trips During Surveillance Testing)**

.4 Annual Followup of Selected Issues: Safety-Related Klockner Moeller Motor Control Center Component Design Modification

a. Inspection Scope

The inspectors performed a review of the licensee’s CAP and associated documents, specifically, AR 02699424, “1VX05C Fan Breaker Trip Alarm,” AR 0205960, “Electrical Overheating Indications on Fused Contactors,” AR 02714273, “Div 2 Battery RM Fan Tripped,” and AR 02704946, “Generic EACE Actions for 1VX05C Fan Breaker Trip Alarm.” The inspectors performed walkdowns and verified the completion of and assessed the adequacy of the corrective actions taken in response to fans 1VX05C, 1VX06C and 2VX05C tripping as the result of overheating of the fan motor contactor coils after the motor control center components had been upgraded. These fans supply ventilation to separate safety related battery rooms for cooling and prevent hydrogen build-up.

The inspector’s review and evaluation was focused on the licensee’s corrective actions to ensure that: complete and accurate identification of the problem was done in a timely manner; consideration of the extent of condition, generic implications, common cause, and previous occurrences was taken; the licensee classified and prioritized the resolution of the problem commensurate with safety significance; the root and contributing causes of the problem were identified; corrective actions were identified and were appropriately focused to correct the problem; corrective actions were completed in a timely manner; corrective actions were effective to preclude repetition; operating experience was adequately evaluated for applicability; and applicable lessons learned were communicated to appropriate organizations.

This review constituted one in-depth problem identification and resolution inspection sample as defined in IP 71152.

b. Background

The original safety-related Klockner Moeller motor control center components installed during the construction of the station are nearing the end of their environmentally qualified life. The licensee approved a design modification to replace the existing Klockner Moeller components with Eaton Corporation components through Westinghouse. On July 9, August 1, and September 10, 2016, the 1VX06C, 1VX05C and 2VX05C fans, respectively, shut down unexpectedly. All fans had received the upgrade to their motor control center. The apparent cause for the fans unexpectedly shutting down was that the fan's motor contactor coils were overheating as a result of operating at higher than design control power levels and an increased coil current due to a design change in the coil construction. In response to this issue, the licensee established a monitoring plan to detect overheating conditions in other susceptible motor control centers that had received the upgrade. Prior to the fans failing, the licensee already had a procedure in place to provide temporary ventilation should a fan failure occur. Additionally, the licensee had already performed an engineering evaluation to verify that the actions outlined in the procedure could be completed prior to any adverse environmental conditions developing in the respective battery rooms.

c. Observations

The inspectors determined that the licensee failed to establish design control measures that verified the adequacy of the design modification from the Klockner Moeller motor control center to the Eaton Corporation motor control center, which was a performance deficiency. The performance deficiency was screened in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, and was determined to be minor. Specifically, the licensee had process and procedure in place to ensure that the safety related batteries are operable.

The issue was entered into the CAP and the licensee is evaluating a design change to the motor control center. Therefore, the inspectors determined that the performance deficiency would not have the potential to become a more significant safety concern, the performance deficiency did not cause a performance indicator to exceed a threshold, and the performance deficiency did not adversely affect any of the cornerstone objectives.

d. Findings

No findings were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 Closed By Letter: Licensee Event Report 05000374/2015002-00, Two Main Steam Safety Relief Valves Failed Inservice Lift Inspection Pressure Test

In NRC Integrated Inspection report 2016003, Licensee Event Report (LER) 05000374/2015002-01, "Two Main Steam Safety Relief Valves Failed Inservice Lift Inspection Pressure Test" was reviewed and closed.

This LER superseded LER 05000374/2015002–00 and the closure review included a review of both LERs. The superseded LER 05000374/2015002–00 has been closed by letter.

This event followup did not constitute an additional sample as defined in IP 71153–05.

#### 4OA5 Other Activities

##### a. Inspection Scope

The inspectors reviewed the licensee's evaluation of the seismic design of specific block walls in the proximity to plant equipment credited in the licensee's Diverse and Flexible Coping Strategies. Inspection scope included onsite review and walk downs during onsite inspection from August 29 to September 2, 2016, and subsequent in-office review through November 4, 2016.

##### b. Findings

###### Block Wall Evaluations Not Consistent with As-Built Conditions

Introduction: The inspectors identified a finding of very-low safety significance (Green) when licensee personnel failed to ensure that the design inputs used in block wall evaluations for determination of their seismic capacities were consistent with the conditions as built or as specified in the design documents. The evaluations were a part of the licensee's response to a NRC Request for Information Pursuant to 10 CFR 50.54(f), regarding Recommendation 2.1: Seismic, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident.

Description: For its response to the NRC Request for Information, the licensee used the Expedited Seismic Evaluation Process (ESEP) as described in the 2013 Technical Report by Electric Power Research Institute titled "Seismic Evaluation Guidance, Augmented Approach for Resolution of Fukushima Near-Term Task Force Recommendation 2.1 – Seismic." This approach was endorsed by the NRC per letter to Nuclear Energy Institute (NEI) dated May 7, 2013, (Agencywide Documents Access and Management System Accession No. ML13106A331). In the same letter, the NRC also accepted the schedule proposed by the NEI requiring plants to complete ESEP modifications by the end of 2016. In the ESEP Report submitted on December 19, 2014, the licensee indicated to the NRC that all equipment evaluated were adequate in resisting the seismic loads resulting from the site Review Level Ground Motion, and therefore no modifications were required as a result of the ESEP. Following the Electric Power Research Institute guidance, the licensee identified certain block walls as needing evaluation for beyond-design-basis seismic demand due to their proximity to installed plant equipment credited in the licensee's Diverse and Flexible Coping Strategies. The deflection or collapse of the identified walls could impact the performance of such equipment. The block wall evaluations, a part of the ESEP, were performed by a vendor and were included in two calculations, 14Q4238–CAL–003 (Revision 1) consisting of hand calculations, and 14Q4238–CAL–006 (Revision 2) consisting of finite element analyses. During review of these calculations, the inspectors identified the following concerns:

- For the walls reinforced by steel supports, the evaluations in Calculation 14Q4238–CAL–003 did not consider the effect of steel post flexibility. The steel posts were assumed to provide rigid boundary condition as lateral wall supports. Large post deflections could undermine this boundary condition assumption and potentially result in additional stresses in the masonry leading to cracking of the masonry. Acceptance criteria for these walls did not allow cracking of masonry. In both the calculations, the section properties used were based on walls being solid (or grouted) while according to the design documents the walls were hollow. It was assumed in the calculations that use of solid section properties would be conservative because overestimating the weight would offset the overestimation of the section properties and the allowable stresses. A further review by the licensee confirmed that the assumption, although conservative for checking flexural stresses, was not conservative for checking shear stresses.
- Multiple openings in the vicinity of critical sections for wall A2–710–19 were not modeled in the finite element analyses in Calculation 14Q4238–CAL–006. Including these openings could result in significantly higher stresses in parts of wall around the openings.
- Modulus of elasticity for use in the evaluations was determined based on 2500 psi masonry unit strength while the design documents indicate the strength to be 1800 psi. Use of a higher modulus of elasticity value would result in increased stiffness and higher wall frequency; and consequently lower seismic acceleration input loads.
- In the finite element analyses, the bottom of the walls was assumed to be simply supported. The evaluations did not validate the assumption by verifying that the shear capacity at the base was more than the reactions indicated by the analysis results.

The calculation deficiencies identified above had an adverse impact on the seismic capacities determined in the evaluations and potentially have an adverse impact on the conclusions of the evaluations and of the ESEP Report submitted to the NRC. The inspectors noted that the licensee had until the end of 2016 to complete any required modifications. The deficiencies did not affect previously existing design basis calculations, and thus the current plant operability was not impacted. The licensee documented the above deficiencies in its CAP under ARs 2712569, 2711669, 2711877, 2710850, 2711337 and 2711875 with actions to revise the affected calculations.

Analysis: The inspectors determined that the failure to use correct design inputs in the block wall evaluations was a performance deficiency. Specifically, the use of inaccurate boundary conditions without adequate justification, the use of non-conservative section properties and modulus of elasticity value, and not including wall penetrations in the analyses could have an adverse impact on the results of the block wall evaluations. A proper review of the drawings and the specifications, and field walk downs would have enabled the licensee to determine correct inputs for use in the evaluations and to avoid the deficiencies.

Using guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor, and thus a finding, because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to determine and use correct design inputs adversely impacted the evaluations of block walls required for protection of the components attached to or located in proximity of the walls, and needed to support implementation of the licensee's Diverse and Flexible Coping Strategies. The inspectors evaluated the finding using the significance determination process in accordance with IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, dated June 19, 2012. The inspectors answered "Yes" to Question A.1, "If the finding is a deficiency affecting the design or qualification of a mitigating SSC, does the SSC maintain its operability or functionality." Specifically, while the finding may impact the licensee's response to the NRC Request for Information Pursuant to 10 CFR 50.54(f) regarding Recommendation 2.1: Seismic, of the Near-Term Task Force, the operability or the functionality of all structures, systems, and components is maintained. Therefore, the finding screened as having very-low safety significance (Green).

The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of field presence where senior managers ensure supervisory and management oversight of work activities, including contractors and supplemental personnel. Specifically, the licensee failed to provide supervisory and management oversight for the activities of the contractor performing the block wall evaluations. [H.2]

**Enforcement:** Inspectors did not identify a violation of regulatory requirements associated with this finding. **(FIN 05000373/05000374/2016004-04, Block Wall Evaluations Not Consistent with As-Built Condition)**

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On January 18, 2017, the inspectors presented the inspection results to Mr. H. Vinyard and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

##### .2 Interim Exit Meetings

Interim exits were conducted for:

- the biennial licensed operator requalification inspection with Mr. D. Wright, Operations Training Manager, by telephone, on December 13, 2016;
- the inspection performed for the review of the block wall evaluation documentation during the period between August 29, 2016, and September 2, 2016, with Mr. G. Ford, Regulatory Assurance Manager, on November 4, 2016;

- the inspection results for the radiation safety program review with Mr. W. Trafton, Site Vice President, on November 18, 2016; and
- the Annual Review of EAL and Emergency Plan Changes with Mr. M. Hayworth, Emergency Preparedness Manager, on December 19, 2016.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

W. Trafton, Site Vice President  
H. Vinyard, Plant Manager  
J. Kowalski, Engineering Director  
G. Ford, Regulatory Assurance Manager  
J. Moser, Radiation Protection Manager  
M. Hayworth, Emergency Preparedness Manager  
R. Conley, Operation Manager  
T. Lanc, Principal Regulatory Engineer  
M. McDonald, Corporate Senior Staff Engineer  
R. Stubblefield, Site Structural Engineer  
L. Simpson, Corporate Senior Engineering Manager  
S. Tanton, Design Engineering Manager  
R. Conley, Radiation Engineering Manager  
D. Wright, Operations Training Manager

#### U.S. Nuclear Regulatory Commission

K. Stoedter, Chief, Reactor Projects Branch 1  
B. Dickson, Chief, Reactor Projects Branch 5

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

05000373/2016004-01; 05000374/2016004-01	NCV	Failure to Perform Required Monthly Fire Extinguisher Inspections per National Fire Protection Association Code (Section 1R05)
05000373/2016004-02; 05000374/2016004-02	NCV	Failure to Provide Sufficient Guidance for the Successful Troubleshooting of Safety-Related Equipment (Section 4OA2)
05000373/2016004-03	NCV	Failure to Perform Preventive Maintenance Resulting in Two Subsequent Unit 1 RCIC Turbine Trips During Surveillance Testing (Section 4OA2)
05000373/2016004-04; 05000374/2016004-04	FIN	Block Wall Evaluations Not Consistent with As-Built Condition (Section 4OA5)

### Closed

05000373/2016004-01; 05000374/2016004-01	NCV	Failure to Perform Required Monthly Fire Extinguisher Inspections per National Fire Protection Association Code (Section 1R05)
05000373/2016004-02; 05000374/2016004-02	NCV	Failure to Provide Sufficient Guidance for the Successful Troubleshooting of Safety-Related Equipment (Section 4OA2)
05000373/2016004-03	NCV	Failure to Perform Preventive Maintenance Resulting in Two Subsequent Unit 1 RCIC Turbine Trips During Surveillance Testing (Section 4OA2)
05000373/2016004-04; 05000374/2016004-04	FIN	Block Wall Evaluations Not Consistent with As-Built Condition (Section 4OA5)

### Discussed

None.



## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 1R04 Equipment Alignment

- 127D1825TD; SLC H22-PO11; 3/14/1989
- 761E218AR; SLC Unit 1, Elev. 820'
- AR 2531538; CCP "1A" SBLC Outboard Oil Sight Glass Needs Turned
- AR 3944107; 0 DG Fuel Oil Tank Level Low Alarm in Early
- AR 3945088; Unexpected MCR Alarm – 0 DG Fuel Oil Tank Level Low
- LOP-DG-02E; Unit 1 1B DG Electrical Checklist; 7/9/1997
- LOP-DG-02M; Unit 1 HPCS Diesel Generator Mechanical Checklist; 11/17/2016
- LOP-DG-03M; Unit 0 Diesel Generator Mechanical Checklist; 12/5/2016
- LOP-DG-08M; Unit 0 Diesel Generator Mechanical Checklist; 12/5/2016
- LOP-HP-01M; Unit 1 High Pressure Core Spray Mechanical Checklist; Revision 17
- LOP-RI-01M; Unit 1 Reactor Core Isolation Cooling System Mechanical Checklist; 12/7/2016
- LOP-SC-01E; Unit 1 Standby Liquid Control System Electrical Checklist; 11/2/2016
- LOP-VG-01M; Unit 1 Standby Gas Treatment System Mechanical Checklist; 11/14/2016
- M-89; P&ID Standby Gas Treatment; Revision AG

### 1R05 Fire Protection

- FZ 2B1; LaSalle County Generating Station Pre-Fire Plan, RX Bldg. 820'6" Elevation, Unit 1 General Area & SBGTS Area; Revision 1
- FZ 2H3; LaSalle County Generating Station Pre-Fire Plan, RX Bldg. 694'6" Elevation, Unit 1 RHR Heat Exchanger "B" Cubicle; Revision 1
- FZ 3B1; LaSalle County Generating Station Pre-Fire Plan, RX Bldg., 820' Elevation, Unit 2 General Area & SBGTS Area; Revision 2
- FZ 3I2; LaSalle County Generating Station Pre-Fire Plan, RX Bldg. 673'4" Elevation, U2 HPCS Cubicle; Revision 1
- LMS-FP-21; Monthly Inspection of Portable Fire Extinguishers; Revision 43
- AR 2608186; Potential Finding and NCV for Fire Extinguisher Inspections
- AR 2739987; NRC Identified: FPR NFPA Code Deviation Matrix Deficiency

### 1R06 Flood Protection Measures

- LS-PSA-012; LaSalle PRA, Internal Flood Analysis, Volume 1 of 2: Summary and Notebook; Revision 1

### 1R11 Licensed Operator Regualification Program

- LOP-NB-03; LORT Dynamic Simulator Scenario Guide S-16-7-1; Revision 0
- LORT Annual Exam Status Report LaSalle County Generating Station 2016

## 1R12 Maintenance Effectiveness

- AR 2442944; 1B SBLC Did Not Achieve 42 GPM During Surveillance; 1/27/2015
- AR 2448318; Control Switch 2C41A-S001 is Intermittent During LES-SC-201; 2/6/2015
- AR 2449080; 2A SC PP Power Frame Crankcase Oil Seal Leak to Gear Housing; 2/7/2015
- AR 2506339; 1A SBLC Pump Did Not Reach Desired Flow 1C41-C001A; 5/27/2015
- AR 2531538; CCP "1A" SBLC Outboard Oil Sight Glass Needs Turned; 7/22/2015
- AR 2695225; WGE. 1VY03C Failure to Auto Start
- AR 2726920-02; Determination for Maintenance Rule SSC U1 VY Functional Failure
- AR 2516457; Less than Adequate Fleet Troubleshooting
- LAS-1-VY; Maintenance Rule System Basis Document, CSCS Equipment Cooling System; 10/17/2016
- WO 1937693-01; 1VY03 Failed to Auto Start when 1B RHR Pump Started; 7/8/2016
- AR 2722425; Apparent Cause Investigation 1VY03YC Failed to Auto Start; 11/4/2016
- AR 2695225; Work Group Evaluation for Failure of 1VY03C Fan to Auto Start when 1B RHR Pump was Started
- AR 2690521; 1VY03C Failed to Auto Start when 1B RHR Pump Started
- MA-AA-716-004; Conduct of Troubleshooting; Revision 13
- AR 2722425; 1VY03C Failed to Auto Start
- AR 2415025; 1HS-Vy005 Hand Switch Broke
- LAS-1-VY-02; Maintenance Rule System Basis Document LAS-1-VY, Cubicle Cooling System for the Reactor Building Corner Rooms; 10/11/2016
- DCP 9400434; ECN 000454E; RHR Pumps Cubicle Cooler Fans; Revision E
- AR 2726920; Unit 1 VY Exceeded Maintenance Rule Reliability Criteria
- Long Term Asset Management Strategy, Circuit Breakers and Switchgear; March 2006
- ER-AA-310; Implementation of the Maintenance Rule; Revision 9
- ER-AA-310-1005; Maintenance Rule – Dispositioning Between (a)(1) and (a)(2); Revision 7
- ER-AA-310-1007; Maintenance Rule – Periodic (a)(3) Assessment, Revision 4
- Maintenance Rule Periodic Evaluation; Unit 1 Standby Liquid Control System; October 2016
- Maintenance Rule Periodic Evaluation; Unit 2 Standby Liquid Control System; October 2016
- Maintenance Rule System Basis Document; Standby Liquid Control System
- WO 1791800-01; Contingency To Rebuild the 1B SBLC Pump, 1C41-C001B; 5/16/2015
- WO 1822021-01; Replace Existing Pump with New Pump, 1C41-C001B; 1/30/2016
- AR 2560658; NRC Identified – Location Error in LOP-SC-01E; 9/25/2015
- AR 1091219; CDBI – Unable to ID ABLC Calcs Re: Head Tank; 7/15/2010
- AR 1113470; Followup to IR 1091219 on SBLC Head Tank; 9/15/2010
- Periodic Assessment of the Maintenance Rule Program; for the Period of July 2014 through June 2016; Dated 9/30/2016
- AR 2442201, SBLC Level Indication Failed Channel Check; 1/26/2015
- AR 2442278, No Safety Class in Passport; 1/26/2015
- AR 2463126, Procedure Correction: LOP-SC-01; 3/4/2015
- AR 2498628, MCR SBLC Tank Level Meter Reads High; 5/11/2015
- AR 2501326, Packing Wall Temps High; 5/15/2015
- AR 2503651, CCP – Issues with Drawing M-99 – U1 SBLC; 5/20/2015
- AR 2503656, CCP – Issues with Drawing M-145 – U2 SBLC; 5/20/2015
- AR 2503659, U1 SBLC Valves Need EPS Labels; 5/20/2015
- AR 2503661, U2 SBLC Valves Need EPN Labels; 5/20/2015
- AR 2516673, Safety: 1C41-F031 Binds when Operating; 6/19/2015
- AR 2546463, Delay in Scheduled Activity; 8/26/2015
- AR 2568784, PCR For LOS-SC-Q1; 10/10/2015
- WO 1956746-01; VY03C Failed to Auto Start; 3/10/2016

- WO 1922020-01; LOS-SC-Q1 1B SBLC Pump Quarterly ATT 1B; 8/4/2016
- WO 1932856-01; LOS-SC-Q1 1A SBLC Pump Quarterly ATT 1A; 9/16/2016
- AR 2722322; (a)(3) Assessment Deficiency Identified; 9/30/2016
- AR 2516698; CCP 1 1A SBLC Pump Oil Sightglass Hard to Access to View; 6/19/2015

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

- AR 2727593; Operating Crew R and Crew O Clock Reset
- Current Installed Protected Pathway List; 11/17/2016
- Email (Exelon) from B. Mooney to D. McBreen re PRA Sheet; 10/12/2016
- LEP-DC-113; Unit 2 Division III 125 Vdc Distribution Panel Temporary Charger Installation; Revision 19
- OP-AA-201-012-1001; Operations Online Fire Risk Management; Revision 1
- Operator's Log; 10/30/2016 – 10/31/2016
- PI-AA-120; Issue Identification and Screening Process; Revision 6
- PI-AA-125; Corrective Action Program (CAP) Procedure; Revision 4
- Risk Recognition/Decision Making Process Flowchart for Switching Run with 1A RHR Paragon Results in Orange Condition; 10/12/2016

#### 1R15 Operability Determinations and Functional Assessments

- 34-27; eSOMS: Active Degraded Equipment List, Unit 2, LCOTR #02-C11-16-01-ROD 34-27; 11/9/2016
- AR 1647125; Part-Length Rod Exposure Limit Basis for AST
- AR 2537519; Part-Length Rods Exposure Limit Basis for AST
- AR 2537664; Part-Length Rods (PLR) Exposure Limit Basis for AST
- AR 2645413; RM – Unit 1 Control Rod 02-19 Position Indication Issues
- AR 2722891; 0DG01K-C Louder than Normal
- AR 2722891; 0DG01K-C Louder than Normal
- AR 2723444; 0 DG AC Cir Oil Pump Coupling Failure
- AR 2724223; Loss of Rod Position Indication for Control Rod 34-27
- AR 2725848; RM-120 DCV Full Closed for Control Rod 34-27
- AR 2735682; Multiple Cracks Found in Cells of 2DC18E
- AR 2736668; U2 PLR Burnup Impact on LOCA Dose Analysis
- AR 2736668; U2 PLR Burnup Impact on LOCA Dose Analysis
- AR 2737634; Loss of Rod Position Indication for Control Rod 34-27
- AR 2738530; RM – Loss of Rod Position Indication Control Rod 34-27 U2
- AR 2738902; 2PLH13J Red LED Alarm Light Lit
- EC 337814; 0 DG Inoperable Due to Loss of Circulating Lube Oil Pump; 6/30/2016
- EC 337814; Special Operator's Log of 0 DG Lube Oil and Jacket Water Temperature; 10/3 – 10/4/2016
- EC 357017; Evaluation of Crack in the Cell 56 Cover of Division 3 125 Vdc Battery 2DC18E) on its Ability to Perform its Design Function; Revision 0
- EC 407055; Evaluation of LaSalle Alternative Source Term Loss-of-Coolant Accident Dose for L2C16 and Impact of Part Length Rods with Burnup > 62 GWd/MTUs; Revision 0
- IR 2737634; Equipment Issue — Loss of Unit 2 Rod Position Indication for Control Rod 34-27
- LOA-RM-201; Loss of One or More Control Rod(s) Position Information in Mode 1 or 2
- LS2 CR079; Control Rod Position Graphs, Operator Notes; 10/5/2016
- Op Eval 16-005; Operability Evaluation of Unit 2 Cycle 16 Core Design and ATRIUM-10 Part Length Fuel Rods, EC 407055, AR 2736668; Revision 0
- OP-AA-106-101-1001; Event Response Guidelines; Revision 26

- Operability Basis; Rod 37–27 RPIS; 10/29/2017
- Operator Notes Referring to Control Rods; 3/19/2016 – 11/5/2016
- WO 1814814-01; Repair/Replace RPIS Connectors/Probes; Revision 0
- WO 1957706–01; Loss of Rod Position Indication for Control Rod 34–27

#### 1R18 Plant Modifications

- Calc. L–003971; Seismic Qualification of Flex 480 V Primary Feed Power Distribution Panel; Revision 0
- Calc. L–004022; Seismic Qualification Report for FLEX AK-25 Shunt Units; Revision 0
- EC 396069; 50.59 Review: Flex Primary Strategy—Electrical; Revision 0
- SEAG 00–000081; Memo from R. Tjernlunk to J. Bakas & K. Nelson: NGG Survey Medium & Low Voltage Switchgear Seismic Qualification Issues; 3/8/2000

#### 1R19 Post-Maintenance Testing

- AR 2735682; Multiple Cracks Found in Cells of 2DC18E
- AR 2735689; Unit 2 Division 3 125 V Battery Cell 54 Had Low Cell Voltage
- EC 357017; Evaluation of Crack in the Cell 56 Cover of Division 3 125 Vdc Battery 2DC18E) on its Ability to Perform its Design Function; Revision 0
- LOS–DC–M5 Att. H; Unit 2 125VDC Division 3 Batt Attachment H; 11/1/2016
- LOS–RH–24; Temporary Fill for A, B & C RHR System Discharge Lines; Revision 12
- LOS–RH–M1; RHR System and RHR WS System Operability Test for Mode 1,2,3,4, and 5; Revision 31
- LOS–RI–Q5; RCIC System Pump Operability, Valve Inservice Tests in Modes 1, 2,3 and Cold Quick Start, Attachment 1A; 10/20/2016
- OE 03–004/AR 152075; Operability Evaluation: Various Unit 1 and 2 Division 3 125 Volt Battery Cells have Surface Cracks or Blistering; Revision 0
- U2 125 VDC Division III Battery Quarterly LOS–DC–Q2 Attachment B; Tech Spec Surveillance; 11/1/2016
- U2 125 VDC Division III Battery/Breaker Checks LOS–DC–W1 Attachment H; Tech Spec Surveillance; 11/1/2016
- WO 1609236–02; Replace Control Relay; 10/5/2016

#### 1R22 Surveillance Testing

- WO 4577391–01; LRA LOS–RI–Q5 U1 RCIC Cold-Quick Start Attachment 1A; 12/19/2016

#### 2RS1 Radiological Hazard Assessment and Exposure Controls

- AR 2628277; NRC Rad Protection Baseline Inspection for Rad Hazard Assessment and Occupational ALARA Planning and Controls; Dated 8/24/2016
- RP-AA-460; Controls for High and Locked High Radiation Areas; Revision 29
- RP-AA-460-1001; Controls for Very High Radiation Areas; Revision 6
- RP-AA-210; Dosimetry Issue, Usage, and Control; Revision 26
- RP-AA-376; Radiological Postings, Labeling, and Markings; Revision 9
- RP-AA-376-1001; Radiological Postings, Labeling, and Markings Standard; Revision 14
- RP-AA-503; Unconditional Release Survey Method; Revision 14
- RP-AA-203-1001; Attachment 1; Personnel Exposure Investigation 15-53; 2/8/2015
- RP-AA-203-1001; Attachment 1; Personnel Exposure Investigation 15-64; 2/11/2015
- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00546; L1R16 Undervessel Equipment Maintenance; Multiple Dates

- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00701; U1 Suppression Chamber Diving Desludge and Inspections; Multiple Dates
- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00906; L1R16 Reactor Cavity Decontamination & Support Activities; Multiple Dates
- Radiation Work Permit and Associated ALARA File; RWP LA-0-16-00224; U1/2 Prefilter Changeout Activities; Multiple Dates
- AR 02541180; Issues with Source Leak Test; Dated 8/13/2015

## 2RS2 Occupational ALARA Planning and Controls

- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00506; L1R16 DW Scaffolds; Multiple Dates
- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00540; L1R16 DW Emergent Work; Various Dates
- Radiation Work Permit and Associated ALARA File; RWP LA-01-16-00545; L1R16 Emergent Undervessel Work; Various Dates
- RP-AA-4004; L1R16 Radiation Protection Outage Report; No Date Provided

## 4OA1 Performance Indicator Verification

- MSPI and WANO Reporting; Unit 1, Core Standby Cooling System (CSCS); July 2015 through July 2016
- MSPI and WANO Reporting; Unit 2, Core Standby Cooling System (CSCS); July 2015 through July 2016
- MSPI and WANO Reporting; Unit 1, Heat Removal System (RCIC); July 2015 through September 2016
- MSPI and WANO Reporting; Unit 2, Heat Removal System (RCIC); July 2015 through September 2016

## 4OA2 Identification and Resolution of Problems

- 2705960; Electrical Overheating Indications on Failed Contactors
- 5430-395; Diagram—Board Assy— PC HPCI & RCIC; 5/12/1971
- 6991-008; Diagram—Meter Assy – Type 180; 11/4/1968
- 8270-849; Diagram—RCIC Control Assy—EGM—48 Vdc Tachometer; 6/4/1971
- 8271-083; Diagram—Converter Assy—Ramp Generator & Signal; 5/30/1973
- 9972-875; Diagram—Wiring Layout, HPCI & RCIC; 6/4/1971
- 9972-883; Diagram—Wiring Layout, 48 Vdc Tachometer; 6/4/1971
- 9976-706; Diagram—Plant System Wiring; 1/2/1974
- 9976-943; Diagram—Plant System Wiring; 6/1970
- Application Note 50517; Recommended Engine Oil Supply System for Small Governors and Actuators; Woodward; Undated
- AR 2699424; 1VX05C Fan Breaker Trip Alarm
- AR 2704946, 2690824, 2705960, 2714273; Apparent Cause Investigation 1VX05C Fan Automatic Trip Alarm Actuated; 8/1/2016
- AR 2704946; Generate EACE Actions for 1VX05C Fan Breaker Trip Alarm
- AR 2705960; Electrical Overheating Indications on Failed Contactors
- AR 2714273; Division 2 Battery RM Fan Tripped
- AR 2729757; Focused Troubleshooting: During Start of U1 RCIC per LOS-RI-Q5, RCIC Tripped on Low Suction Pressure; 10/19/2016
- AR 2742541; 1E51-N006 Found Outside of Expanded Tolerance

- AR 2742719; Engineering Evaluation for RCIC Suction Line Draining
- AR 2742719; Engineering Evaluation for RCIC Suction Line Draining
- AR 3943018; Sludge Found in RCIC Vacuum Tank
- AR 3943191; U1 RCIC Baro Cond Vac Level Switch Sticking
- EC 368842; Review of Procedurally Controlled TCCP Controlled by LOP-VX-02; Revision 0
- EC 4000042; Design Consideration Summary: Units 1 and 2 2015 Online Replacement of Klockner Moeller MCC Cubicles; Revision 4
- Figure 32-4; Training Document—RCIC Turbine Governor System; 4/2009
- L15-195; EC 4000042, 50.59 Screening: Units 1 and 2, 2015 Online Replacement of Klockner Moeller MCC Cubicles; Revision 0
- LIS-RI-102; Unit 1 RCIC Pump Discharge Flow Indication Calibration; Revision 11
- LIS-RI-115; ESI Training Drawing, RCIC Control System; 10/29/2009
- LOP-VX-02 Switchgear Heat Removal System Shutdown; Revision 18
- LOS-RI-Q5; Reactor Core Isolation Cooling System Pump Operability, Valve Inservice Tests in Modes 1, 2,3 and Cold Quick Start; Revision 39
- M-101; P&ID Reactor Core Isolation Coolant (R.C.I.C.); Revision BH
- M-101; P&ID Reactor Core Isolation Coolant System; Revision AR
- M-2101; P&ID / C&I, Details RCIC System "RI"; Revision J
- M-96; P&ID Residual Heat Removal System (RHRS); Revision AG
- OE 16-004; Klockner-Moeller MCC, Division 2 Battery Room Fan Trip, IR 2714273; Revisions 0 and 1
- RCIC Pump Flow Charts; Various Dates
- RCIC Pump Suction Pressure Chart; Various Dates
- RCIC Turbine Speed Chart; Various Dates
- RI-1; RCIC System Drawing, Training Document, 5/29/2009
- SIL 336R1; Letter from GE Nuclear Energy to BWR Utility re Surveillance Testing Recommendations for HPCI and RCIC Systems; 12/11/1989
- Status Update, BWR RCIC/HPCI Terry Turbine Governor Control Systems Change-Out; 4/12/2010
- Training Drawing; RCIC; Undated
- WO 1960938-01; U1 RCIC Trip on Low Suction Pressure; 10/19/2016
- WOs 1960940-01, 02, 03, 04; U1 RCIC Discharge Flow Controller; 10/19/2016

#### 4OA5 Other Activities

- AR2682808; UFSAR Omitted Block Wall Referenced Information
- AR2710850; Incorrect Masonry Unit Strength Used in ESEP Calculations
- AR2711337; Non-Conservative Version of Masonry Code Used in ESEP Calculations
- AR2711370; Incorrect Overstress Factor Statement in UFSAR
- AR2711669; NRC Identified Assumption Judgment Made in ESEP Calculations
- AR2711868; NRC Identified, Provide Benchmarking Info for Block Wall FEA
- AR2711875; NRC Identified Justify for Block Wall Boundary Conditions
- AR2711877; NRC Identified Block Wall FEM Missing Existing Openings
- AR2712569; NRC Identified Investigate BW Composite Flexibility Basis
- AR2725453; NRC Identified Investigate BW Composite Flexibility Basis
- RS-14-298; EXELON Letter to NRC, Exelon Generating Company LLC Expedited Seismic Evaluation Process Report; 12/19/2014
- Drawing A-1; West Elevation; Revision N
- Drawing A-65; Typical Masonry Wall Details Sheet -2; Revision W
- Drawing A-185; Auxiliary Building Ground Floor Plan, Unit 2; Revision BD
- Drawing A-186; Auxiliary Building Mezzanine Floor Plan, Unit 2; Revision AR

- Drawing A-268; Typical Masonry Wall Section and Details; Revision H
- Drawing A-270; Block Wall Support Post Schedule – Sheet 1; Revision AN
- Drawing A-752; Block Wall Support Post Schedule; Revision AB
- CALC 14Q4238-CAL-001; Generation of In-Structure Response Spectra for Use in ESEP Evaluations; Revision 1
- CALC 14Q4238-CAL-003; Seismic Capacity of Masonry Structures for ESEP; Revision 1
- CALC 14Q4238-CAL-006; Finite Element Analysis of Select Masonry Walls; Revision 2
- SD&D Report No. 25; Concrete and Brick Masonry Design Criteria; 12/5/1975
- Specification J-2598; Superstructure Work, Division 4- Masonry; 5/1/1975
- Report No. SAD-394; Dynamic Analysis of Column Reinforced Masonry Walls; Revision 2
- SD&DD Report No. 78; Design/Reevaluation Criteria for Category I Concrete Masonry Walls; Revision 2

Action Requests Generated from NRC or Illinois Emergency Management Agency Inspection

- 2725109; Inaccurate ILT Certified 398 Forms Submittals – NRC Id'd
- 2725453; NRC Identified Investigate BW Composite Flexibility Basis
- 2731494; NRC Identified (sic): Pipe Support Rod for 1WS160B is Broken
- 2738141; NRC Identified CDF Value Discrep in CDE vs. MSPI Basis Doc
- 2739987; NRC Identified: FPR NFPA Code Deviation Matrix Deficiency
- 2742757; NRC ID Typo in (A)(3) Assessment Report
- 2742807; NRC Observation Regarding Maintenance Rule Bases

## LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
AR	Action Request
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
DG	Diesel Generator
EG-R	Electronic Governor-Remote
ESEP	Expedited Seismic Evaluation Process
FIN	Finding
HPCS	High Pressure Core Spray
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LER	Licensee Event Report
LLC	Limited Liability Corporation
LPCI	Low Pressure Coolant Injection
MOC	Mechanism Operated Contact
MSPI	Mitigating System Performance Indicator
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SSC	System, Structure, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VDC	Volts Direct Current



B. Hanson

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Letter to Bryan C. Hanson from Karla Stoedter dated February 1, 2017

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2—NRC INTEGRATED  
INSPECTION REPORT 05000373/2016004, 05000374/2016004,  
05000373/2016501 and 05000374/2016501

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