



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

July 30, 2015

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

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2  
NRC INTEGRATED INSPECTION REPORT 05000254/2015002;  
05000265/2015002

Dear Mr. Hanson:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. The enclosed report documents the results of this inspection, which were discussed on July 7, 2015, with Mr. S. Darin, and other members of your staff.

Based on the results of this inspection, two self-revealed findings of very low safety significance were identified. The findings involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of this NCV, 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 a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission-Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Quad Cities Nuclear Power Station. In addition, if you disagree with the cross-cutting aspect assigned 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 Quad Cities Nuclear Power Station.

B. Hanson

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In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

Docket Nos. 50-254; 50-265  
License Nos. DPR-29; DPR-30

Enclosure:  
IR 05000254/2015002; 05000265/2015002  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-254; 50-265  
License Nos: DPR-29; DPR-30

Report No: 05000254/2015002; 05000265/2015002

Licensee: Exelon Generation Company, LLC

Facility: Quad Cities Nuclear Power Station, Units 1 and 2

Location: Cordova, IL

Dates: April 1 through June 30, 2015

Inspectors: R. Murray, Senior Resident Inspector  
K. Carrington, Resident Inspector  
G. O'Dwyer, Reactor Inspector  
M. Mitchell, Health Physicist  
C. Phillips, Branch 1 Project Engineer  
C. Mathews, Illinois Emergency Management Agency

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

Enclosure

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## SUMMARY OF FINDINGS

Inspection Report 05000254/2015002, 05000265/2015002; 04/01/2015–06/30/2015; Quad Cities Nuclear Power Station, Units 1 & 2; Identification and Resolution of Problems.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were self-revealed. The findings were considered non-cited violations (NCV) of the U.S. Nuclear Regulatory Commission (NRC) regulations. 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 June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" effective date December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 5, dated February 2014.

### Cornerstone: Initiating Events

Green. A finding of very low safety significance and associated NCV of Technical Specification 5.4, "Procedures," was self-revealed on March 14, 2015, for the licensee's failure to implement a clearance order in accordance with procedure OP-AA-109-101, "Clearance and Tagging," for electrical maintenance on Bus 12, Cubicle 9. The clearance order failed to provide a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection. Immediate corrective actions included stopping all electrical work and verifying electrical work boundaries prior to re-commencing work. The licensee documented the issue in the corrective action program (CAP) under Issue Report 2468511.

The finding was determined to be more than minor because, if left uncorrected, it could become a more significant safety concern. Specifically, the failure to properly control and de-energize equipment prior to performing maintenance could have an impact on safety-related equipment (including equipment damage and potential loss of off-site power). The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings." Because the finding impacted the Initiating Events Cornerstone and Unit 1 was shut down at the time of the event, the inspectors determined the finding could be further evaluated using IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings." The inspectors answered "No" to all questions in Exhibit 2 of IMC 0609, Appendix G, Attachment 1 and determined the finding was of very low safety significance (Green). This finding has a cross-cutting aspect in the area of Human Performance, Work Management because the licensee did not implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee failed to plan, control, and execute a clearance order that provided a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection during maintenance on Bus 12, Cubicle 9 [H.5]. (Section 4OA2.9)

## **Cornerstone: Mitigating Systems**

Green. A finding of very low safety significance and associated NCV of Technical Specification 5.4, "Procedures," was self-revealed on March 22, 2015, for the licensee's failure to conduct procedurally required post-maintenance testing on reactor core isolation cooling (RCIC) motor operated valve (MOV) MO 1-1301-61, following operation of the valve in the manual mode. Immediate corrective actions included manually engaging the motor clutch and functionally stroking the valve from the control room to verify operation. The licensee captured this condition in their CAP as Issue Report 2472416.

The finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and 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 was not able to ensure the operability of the RCIC system when they failed to conduct post-maintenance testing (PMT) on RCIC 1-1301-61. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors answered "No" to all questions in Section A of Exhibit 2 and the finding screened as Green, or very low safety significance. This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because the licensee did not maintain complete, accurate, and up-to-date documentation. Specifically, the licensee failed to document the status of the RCIC valve after placing it in the manual mode of operation to ensure that the required PMT was performed [H.7]. (Section 4OA2.8)

## **REPORT DETAILS**

### **Summary of Plant Status**

#### **Unit 1**

The unit began the inspection period operating at full power. On April 2, 2015, the licensee conducted an emergent unplanned downpower of the unit to 20 percent power in an attempt to isolate a steam leak from an electrohydraulic control (EHC) unit pressure transmitter sensing line. The unit was manually scrammed from 20 percent power following an unsuccessful attempt to isolate the leak. The leak was repaired during forced outage Q1F65. On April 5, the licensee commenced startup of the unit and synchronized the turbine to the grid. The unit achieved full power on April 6, where it remained throughout the remainder of the evaluated period, with the exception of planned downpowers for routine surveillances and control rod pattern adjustments.

#### **Unit 2**

The unit began the inspection period operating at full power. On June 27, 2015, the licensee commenced an unplanned downpower of the unit to approximately 48 percent power to isolate an EHC fluid leak from a turbine control valve sensing line for the reactor protection system. The leak was repaired and the unit returned to full power the same day. The unit remained at full power through the remainder of the evaluation period, with the exception of planned downpowers for routine surveillances and control rod pattern adjustments.

### **1. REACTOR SAFETY**

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

##### **1R01 Adverse Weather Protection (71111.01)**

##### **.1 Readiness of Offsite and Alternate Alternating Current Power Systems**

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

On May 15, 2015, the inspectors walked down the station switchyard and relay housing to verify their material conditions. The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- coordination between the TSO and the plant during off-normal or emergency events;
- explanations for the events;
- estimates of when the offsite power system would be returned to a normal state; and

- notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- re-assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures.

This inspection constituted one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

.2 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee’s preparations for summer weather for selected systems, including conditions that could lead to an extended drought.

During the inspection, the inspectors focused on plant specific design features and the licensee’s procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. The inspectors’ reviews focused specifically on the following plant systems:

- Units ½ (common or Unit 0), 1, and 2 emergency diesel generator (EDG) ventilation; and



- Units 1 and 2 battery room ventilation.

This inspection constituted one seasonal adverse weather sample as defined in IP 71111.01–05.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Condition—Tornado and Severe Thunderstorm Watch

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for the week of April 6, 2015, the inspectors reviewed the licensee’s overall preparations/protection for the expected weather conditions. On April 8, 2015, the inspectors walked down the licensee’s normal and emergency AC power systems, because their safety-related functions could be affected or required as a result of high winds, tornado-generated missiles, or the loss of offsite power. The inspectors evaluated the licensee staff’s preparations against the site’s procedures and determined that the staff’s actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee’s procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition sample as defined in IP 71111.01–05.

b. Findings

No findings were identified.

.4 Readiness For Impending Adverse Weather Condition—Heavy Rainfall/External Flooding Conditions

a. Inspection Scope

Since heavy rainfall (greater than 1.5 inches of rain in a 24-hour period) was forecast in the vicinity of the facility for the week of June 24, 2015, the inspectors evaluated the design, material condition, and procedures for coping with the expected flooding conditions based on predicted rainfall and rises in local river and lake levels. The evaluation included a review to check for deviations from the descriptions provided in the UFSAR for features intended to mitigate the potential for flooding. As part of this

evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during the predicted flood conditions or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the abnormal operating procedure and compensatory measures for mitigating the expected flooding conditions to ensure they could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition sample as defined in IP 71111.01–05

b. Findings

No findings were identified.

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 2 'A' residual heat removal service water (RHRSW) subsystem during the Unit 2 'C' RHRSW piping elbow replacement;
- Unit 1 station blackout (SBO) diesel generator (DG) system during planned maintenance that included a loss of power to the SBO DG building;
- Unit 1 'B' residual heat removal (RHR) subsystem during planned maintenance on the Unit 1 'A' RHR subsystem; and
- Unit 1 'A' standby liquid control (SBLC) subsystem during planned maintenance on the Unit 1 'B' SBLC subsystem.

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, 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 four partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On May 18–19 and June 19, 2015, the inspectors performed a complete system alignment inspection of the Unit 2 EDG system to verify its functional capabilities. 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.

This was not counted as a sample since the sample was previously credited in Integrated IR 05000254/2015001; 05000265/2015001.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

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 (FZ) 14.1, Radwaste, Elevations 597’-11” and 620’-11”, Ground Floor and Basement Areas;
- FZ 9.2, Unit 2 DG, Elevation 595’ (Plant Barrier Impairment 3815 for the Unit 2 EDG door);
- FZs 17.1.1 and 17.1.3, Unit 1 Reserve Auxiliary and Main Transformers, Elevation 595’-0”; and
- FZ 1.1.1.2, Unit 1 Reactor Building, Elevation 595’-0”, Ground Floor.

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. 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 71111.05–05.

b. Findings

No findings were identified.

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 corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas 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 1 and Unit 2 Turbine Building, Elevation 595'; and
- Unit 1 and Unit 2 Turbine Building, Elevation 547'.

Documents reviewed during this inspection 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.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed and observed the licensee's inspection of the Unit 1 'A' RHR room cooler to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled inspections and the frequency of inspections. Documents reviewed for this inspection are listed in the Attachment to this document.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results, and cooler inspection results associated with the Unit ½ 'A' EDG heat exchanger (0-6661-A H15), the Unit ½ 'B' EDG heat exchanger (0-6661-B H15), and the 1B RHR pump mechanical seal cooler (actually two separate coolers). These heat exchangers/coolers were chosen based on their risk significance in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions, their operating history, and their relatively low margin.

For the Unit ½ 'A' EDG heat exchanger (0-6661-A H15), the Unit ½ 'B' EDG heat exchanger (0-6661-B H15), and the 1B RHR pump mechanical seal cooler; the inspectors verified that testing, inspection, maintenance, and monitoring of biotic-fouling and macro-fouling programs were adequate to ensure proper heat transfer. This was accomplished by verifying: (1) the test method used was consistent with accepted industry practices, or equivalent; (2) the test conditions were consistent with the selected methodology; (3) the test acceptance criteria were consistent with the design basis values; and (4) results of heat exchanger performance testing. The inspectors also verified that the test results appropriately considered differences between testing conditions and design conditions, the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities

below design basis values, and test results considered test instrument inaccuracies and differences.

For the Unit ½ 'A' EDG heat exchanger (0-6661-A H15), the Unit ½ 'B' EDG heat exchanger (0-6661-B H15), and the 1B RHR pump mechanical seal cooler, the inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors verified the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards, the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards, and the as-found results were recorded, evaluated, and appropriately dispositioned such that the as-left condition was acceptable.

In addition, the inspectors verified the condition and operation of the Unit ½ 'A' EDG heat exchanger (0-6661-A H15), the Unit ½ 'B' EDG heat exchanger (0-6661-B H15), and the 1B RHR pump mechanical seal cooler were consistent with design assumptions in heat transfer calculations and as described in the UFSAR. This included verification that the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors verified the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger.

The inspectors reviewed the performance of the ultimate heat sink, diesel generator cooling water (DGCW) and RHR safety-related service water systems and their subcomponents (such as piping, pumps, valves, etc.) by tests or other equivalent methods to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors reviewed performance test results for the ultimate heat sink and service water systems. This included a review of the results of performance tests for key pumps and valves in the systems and the results of service water flow balance tests. In addition, the inspectors compared the flow balance test configurations and results to those assumed in the UFSAR during design basis accident conditions. The inspectors also reviewed the interface between safety-related service water systems and non-safety-related water systems to verify their adequacy during design basis events. The inspectors also ensured consistency between the licensee's testing methodologies and design basis leakage rate assumptions.

The inspectors performed a system walk down of accessible portions of the DGCW and RHR service water systems to verify the licensee's assessment of their structural integrity. In addition, the inspectors reviewed available testing and inspection results, the licensee's disposition of active through wall pipe leaks, and the history of through wall pipe leakage to identify any adverse trends since the last NRC inspection. For buried or inaccessible piping, the inspectors reviewed the licensee's pipe testing, inspection and monitoring program, and interviewed responsible licensee personnel to verify that structural integrity, leakage or degradation issues had been appropriately identified and dispositioned by the licensee. The inspectors also reviewed the periodic piping inspection program to verify its adequacy for detecting and correcting protective coating failure, corrosion and erosion.

In addition, the inspectors reviewed condition reports related to heat exchangers, coolers and heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report.

These inspection activities constituted four triennial heat sink inspection samples as defined in IP 71111.07–05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

a. Inspection Scope

On June 23, 2015, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and 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

a. Inspection Scope

On April 2, 2015, the inspectors observed operators perform a cooldown of the Unit 1 reactor following a manual scram that was performed in response to an unisolable steam

leak on the Unit 1 main steam header in the low pressure heater bay. This was an activity that required heightened awareness and/or was 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.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- Unit 1 and Unit 2 drywell containment atmospheric monitoring systems;
- Unit 1 and Unit 2 local power range monitoring systems; and
- Unit 1 and Unit 2 control rod drive systems.

The inspectors reviewed events such as where ineffective equipment maintenance could have 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 structures, systems, 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 samples 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:

- Work Week Profile 15–14–03: Unit 1 online risk yellow due to maintenance on line 0405 (loss of redundancy to transformer T12), anticipated high winds (30 mph), and Unit 1 forced outage Q1F65 on April 2, 2015;
- Work Week Profile 15–16–05: Planned Reactor Core Isolation Cooling (RCIC) maintenance and unplanned yellow risk for debris in transformer T12 line tower;
- Work Week Profile 15–17–06: Units 1 and 2 online risk changes to yellow due to the 2A 125 Vdc battery charger testing, the 2C RHRSW water system pump elbow replacement, and partial testing of the Unit 2 EDG;
- Work Week Profile 15–18–07: Units 1 and 2 online risk changes to yellow due to U1 125 Vdc battery service test and swap to alternate battery; RHR/RHRSW heat exchanger relief valve replacement;
- Work Week Profile 15–19–08: Unit 2 online risk yellow due to planned High Pressure Coolant Injection (HPCI) system maintenance, Unit 2 'A' EHC emergent pump replacement, Unit 1 'A' EHC relief valve replacement, Offsite Line 0405 out-of-service for planned transmission work; and
- Emergent work on Unit 2 week of June 21, 2015, due to EHC fluid leak from turbine control valve 4 pressure switch sensing line.

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 during this inspection are listed in the Attachment to this report.

These maintenance risk assessments and emergent work control activities constituted six 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:

- Operability Evaluation Engineering Change (EC) 401502: RHRSW High Pressure Discharge Elbow Possibly Degraded;
- Issue Report (IR) 2480279: U2 EDG Starting Air Solenoid Valve Leaking Air;
- Operability Evaluation EC 401570: RCIC Turbine Steam Supply Motor Operated Valve 1–1301–61 Clutch Assembly is Degraded (IR 2472416);
- IR 2496170: Delay in U2 HPCI Logic Testing Due to MSC Limit Switch;
- IR 2506324: Aborted U2 QCOS 1300–05 RCIC Pump Operability Test;
- IR 2511669: Part 21 for Allen Bradley Relays; and
- IR 2507805: Unit 2 EDG Room Temperature Indication.

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 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 corrective action 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 seven samples as defined in IP 71111.15–05.

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 testing (PMT) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Unit 1 3B automatic depressurization system valve testing following valve and vacuum breaker replacement and repairs;
- Unit 2 2C RHRSW system pump operability testing following its pump discharge elbow replacement;
- Unit 2 undervoltage/degraded voltage relay function (as-left) testing following preventive maintenance;
- Unit 2 HPCI logic (as-left) testing following preventive maintenance; and
- Unit 1 1B SBLC pump testing following pump overhaul/preventive maintenance.

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 corrective action 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 five PMT samples as defined in IP 71111.19–05.

#### b. Findings

No findings were identified.

## 1R20 Outage Activities (71111.20)

### .1 Other Outage Activities

#### a. Inspection Scope

The inspectors evaluated outage activities for an unscheduled, forced outage Q1F65 that began on April 2 and continued through April 6, 2015. The outage began following a manual scram from approximately 20 percent reactor power in response to an unisolable steam leak on the Unit 1 main steam header in the low pressure heater bay.

The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the Outage Safety Plan for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of selected clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- controls over the status and configuration of electrical systems to ensure that TS and Outage Safety Plan requirements were met;
- monitoring of decay heat removal processes, systems, and components;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- startup and ascension to full power operation, tracking of startup prerequisites; and
- licensee identification and resolution of problems related to the forced outage activities.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one other outage sample as defined in IP 71111.20–05.

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 activities 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:

- QCIS 1000–09: RHR Discharge Pressure Switch Calibration/Functional Test (Routine);
- QCEMS 0210–02: Battery Charger Testing for Safety-Related 125 Vdc Batteries (Routine);
- QCOS 1000–31: 1A Loop Low Pressure Coolant Injection and Containment Cooling Modes of RHR Non-outage Logic Test (Routine); and
- Surveillance Test Interval Change for EDG Largest Load Reject Surveillances, Emergency Core Cooling System Simulated Auto Actuation and EDG Auto-Start Surveillances, and 4kV Bus Undervoltage Functional Test Surveillances (Routine).

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;
- measuring and test equipment calibration was current;
- 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; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- 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 four routine surveillance testing samples as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of routine licensee emergency drills on April 29 and May 7, 2015, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the control room simulator, operations support center, and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee's drill critique to compare any inspector-observed weaknesses with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

These emergency preparedness drill inspections constituted two samples as defined in IP 71114.06-06.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

This inspection constituted one complete sample as defined in IP 71124.08-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the solid radioactive waste system description in the UFSAR, the Process Control Program, and the recent Radiological Effluent Release Report for information on the types, amounts, and processing of radioactive waste disposed.

The inspectors reviewed the scope of quality assurance audits in this area since the last inspection to gain insights into the licensee's performance and inform the "smart sampling" inspection planning.

b. Findings

No findings were identified.

.2 Radioactive Material Storage (02.02)

a. Inspection Scope

The inspectors selected areas where containers of radioactive waste are stored and evaluated whether the containers were labeled in accordance with 10 CFR 20.1904, "Labeling Containers," or controlled in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements."

The inspectors assessed whether the radioactive material storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20, "Standards for Protection Against Radiation." For materials stored or used in the controlled or unrestricted areas, the inspectors evaluated whether they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801, "Security of Stored Material," and 10 CFR 20.1802, "Control of Material Not in Storage."

The inspectors evaluated whether the licensee established a process for monitoring the impact of long term storage (e.g., buildup of any gases produced by waste decomposition, chemical reactions, container deformation, loss of container integrity, or re-release of free-flowing water) that was sufficient to identify potential unmonitored, unplanned releases or non-conformance with waste disposal requirements.

The inspectors selected containers of stored radioactive material, and assessed for signs of swelling, leakage, and deformation.

b. Findings

No findings were identified.

.3 Radioactive Waste System Walkdown (02.03)

a. Inspection Scope

The inspectors walked down accessible portions of select radioactive waste processing systems to assess whether the current system configuration and operation agreed with the descriptions in the UFSAR, Offsite Dose Calculation Manual, and the Process Control Program.

The inspectors reviewed administrative and/or physical controls (i.e., drainage and isolation of the system from other systems) to assess whether the equipment, which is not in service or abandoned in place, would contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors assessed whether the licensee reviewed the safety-significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments."

The inspectors reviewed the adequacy of changes made to the radioactive waste processing systems since the last inspection. The inspectors evaluated whether changes from what is described in the UFSAR were reviewed and documented in accordance with 10 CFR 50.59, as appropriate, and to assess the impact on radiation doses to members of the public.

The inspectors selected processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers and assessed whether the waste stream mixing, sampling procedures, and methodology for waste concentration averaging were consistent with the Process Control Program and provided representative samples of the waste product for the purposes of waste classification, as described in 10 CFR 61.55, "Waste Classification."

For those systems that provide tank recirculation, the inspectors evaluated whether the tank recirculation procedures provided sufficient mixing.

The inspectors assessed whether the licensee's Process Control Program correctly described the current methods and procedures for dewatering and waste stabilization (e.g., removal of freestanding liquid).

b. Findings

No findings were identified.

.4 Waste Characterization and Classification (02.04)

a. Inspection Scope

The inspectors selected the following radioactive waste streams for review:

- Powdex® Resins;
- Reactor Water Cleanup Resin; and
- Dry Active Waste.

For the waste streams listed above, the inspectors assessed whether the licensee's radiochemical sample analysis results (i.e., "10 CFR Part 61" analysis) were sufficient to support radioactive waste characterization as required by 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The inspectors evaluated whether the licensee's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analyses for the selected radioactive waste streams.

The inspectors evaluated whether changes to plant operational parameters were taken into account to: (1) maintain the validity of the waste stream composition data between the annual or biennial sample analysis update; and (2) assure that waste shipments continued to meet the requirements of 10 CFR Part 61 for the waste streams selected above.

The inspectors evaluated whether the licensee had established and maintained an adequate Quality Assurance Program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55 and 10 CFR 61.56, "Waste Characteristics."

b. Findings

No findings were identified.



.5 Shipment Preparation (02.05)

a. Inspection Scope

The inspectors observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness. The inspectors assessed whether the requirements of applicable transport cask certificate of compliance had been met. The inspectors evaluated whether the receiving licensee was authorized to receive the shipment packages. The inspectors evaluated whether the licensee's procedures for cask loading and closure were consistent with the vendor's current approved procedures.

The inspectors observed radiation workers during the conduct of radioactive waste processing and radioactive material shipment preparation and receipt activities. The inspectors assessed whether the shippers were knowledgeable of the shipping regulations and whether shipping personnel demonstrated adequate skills to accomplish the package preparation requirements for public transport with respect to:

- As appropriate, the licensee's response to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," dated August 10, 1979; and
- Title 49 CFR Part 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communication, Emergency Response Information, Training Requirements, and Security Plans," Subpart H, "Training."

b. Findings

No findings were identified.

.6 Shipping Records (02.06)

a. Inspection Scope

The inspectors evaluated whether the shipping documents indicated the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and UN number for the following radioactive shipments:

- QC-13-067: Powdex® Resin to Clive, dated October 8, 2013;
- QC-14-058: Shipping Package Trinuke Filters to Clive, dated September 11, 2014;
- QC-14-069: Reactor Water Cleanup Resins to Clive; dated October 21, 2014;
- QC-14-070: Reactor Water Cleanup Resins to Clive; dated October 28, 2014;
- QC-14-101: Dry Active Waste To Bear Creek; dated April 11, 2014; and
- QC-14-317: Unit 2 Refuel Mast to Wilmington; dated February 21, 2014.

Additionally, the inspectors assessed whether the shipment placarding was consistent with the information in the shipping documentation.

b. Findings

No findings were identified.

.7 Identification and Resolution of Problems (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by the licensee at an appropriate threshold, were properly characterized, and were properly addressed for resolution in the licensee Corrective Action Program. Additionally, the inspectors evaluated whether the corrective actions were appropriate for a selected sample of problems documented by the licensee that involve radioactive waste processing, handling, storage, and transportation.

The inspectors reviewed results of selected audits performed since the last inspection of this program and evaluated the adequacy of the licensee's corrective actions for issues identified during those audits.

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**

40A1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system (RCS) leakage performance indicator (PI) for Quad Cities, Units 1 and 2, for the period April 1, 2014, through March 31, 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period of April 2014 through April 2015 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's IR 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 RCS leakage samples as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

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

a. Inspection Scope

As part of the various baseline inspection procedures 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, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to 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 and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual 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. Based on a recent increase in operability related issues, the inspectors' review was focused on degraded and non-conforming conditions and the licensee's operability determinations associated with those conditions. The inspectors' review nominally considered the 6-month period of January 1, 2015, through June 30, 2015, although some examples expanded beyond those dates where the scope of the trend warranted.

This review constituted one semi-annual trend inspection sample as defined in IP 71152-05.

b. Observations

The inspectors reviewed IR 2453193 that documented an issue with the Unit 1 EDG fuel oil transfer pump (FOTP) discharge pressure taking longer than expected to reach a satisfactory value. The inspectors reviewed the immediate operability evaluation and determined the licensee had documented a reasonable assurance of operability. However, the inspectors noted that the licensee had not identified the specific degraded condition that was causing the issue. The inspectors questioned what assurance the licensee had that the unknown degraded condition would not continue to worsen. Following the inspectors questions, the licensee conducted troubleshooting and eventually determined that there was not a degraded condition of the FOTP, but rather the system configuration was such that it took longer to achieve the rated discharge pressure for the pump. A recent procedure change had failed to take this system configuration into account and the acceptance criteria had not been adjusted accordingly. The inspectors noted that IMC 0326, "Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety," states, in part, that the basis for continued operation with degraded or non-confirming conditions should be frequently and regularly reviewed until corrective actions are successfully completed.

The inspectors reviewed the prompt operability evaluation for RCIC MO 1-1301-61, the RCIC turbine steam inlet valve, documented under OpEval EC 401570. The inspectors noted that the operability evaluation was focused on the operation of the valve clutch and actuator and did not discuss all aspects of the issue that could affect operability. Specifically, neither the immediate nor prompt operability evaluations evaluated or discussed what gave the valve an open signal (operators had found the valve motor running with no corresponding change in valve position). In addition, the operability evaluations failed to evaluate the impact of the valve motor running for an extended period of time. The licensee captured the inspectors concern in the CAP under IR 2484352 and concluded RCIC remained operable.

The inspectors reviewed IR 2480279 associated with an air leak on the Unit 2 EDG air start system. The inspectors identified that the immediate operability evaluation was not applicable to the location of the leak identified in the condition report. Following the

inspectors questions, the licensee updated the operability evaluation and determined that the Unit 2 EDG remained operable but degraded with the leak in the system.

The inspectors also reviewed IR 2507805 that was generated on May 31, 2015, for the Unit 2 EDG Temperature Controller 2-5790-1 that was identified to have failed. The operability evaluation described the impact of the degraded condition on the EDG ventilation system. The temperature controller operated the position of the outside air dampers and because it could not perform its function, the outside air dampers would fail to automatically open when EDG room temperature reached 85 degrees Fahrenheit (°F). The evaluation also concluded that due to current outside air temperatures being relatively moderate, there was no effect on U2 EDG operability. The inspectors noted that the licensee was not able to immediately correct the problem due to parts availability and the licensee needed a modification to correct the degraded condition. On June 17, 2015, the inspectors questioned the licensee on how long they expected to operate with the degraded condition (considering the upcoming summer months and potential for extreme hot weather conditions). In addition, the inspectors questioned the licensee on available procedures for operators to manually open the outside air dampers. The inspectors noted that alarm response procedure QCOA 6600-08, "Unit 1(2) Diesel Generator Room Vent Fan Failure," directed that upon receiving an EDG room temperature alarm at 125°F (design temperature for the ventilation system is to maintain room temperature less than 120°F), operators in the field were to "verify the outside air dampers are open." The procedure did not give any specific information to the operators on how to accomplish this task. The inspectors also noted that the operability evaluation failed to evaluate the maximum turbine building temperature that could still support operability considering the EDG ventilation calculation was based on outside air temperatures. The licensee had stated that while 120°F was the maximum design EDG room temperature, operability could still be supported up to 140°F, and short term operation above 120°F was acceptable; however, the licensee did not identify a specific period of time that operation above 120°F was allowed. The licensee generated IR 2516072 following the inspectors' questions. Operations developed a revision (TIC 3312) to QCOA 6600-08 that added specific steps to allow operators in the field to fail vent fan dampers open, if needed, and briefed operators on the degraded condition and procedural changes. The licensee completed their corrective actions to the temperature controller on June 23, 2015. The inspectors concluded that the Unit 2 EDG maintained operability with the non-functional temperature controller.

As part of their response to the inspectors' concerns with the trend in the quality of operability determinations, the licensee instituted a process of having multiple shift managers (normally two) review the immediate operability determinations in condition reports to ensure adequate justification of operability.

c. Findings

No findings were identified.

.4 Annual Follow-up of Selected Issues: Operations Aggregate Performance Root Cause

a. Inspection Scope

The inspectors reviewed the licensee's root cause evaluation into recent operational performance issues that have occurred at the station since 2014. The root cause was

documented in the licensee's CAP under IR 2443241-04. While each event had been previously reviewed by the inspectors, the inspectors were particularly interested in the licensee's evaluation of common causes and planned corrective actions. The inspectors did not identify any new issues in the root cause evaluation.

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

b. Findings

No findings were identified.

.5 Annual Follow-up of Selected Issues: Root Cause for Unit 1 Manual Scram Due to Leak on D-Ring Header

a. Inspection Scope

The inspectors reviewed the licensee's root cause investigation into a manual scram that was conducted on April 2, 2015, on Unit 1 due to an unisolable steam leak that occurred on the main steam distribution header, located in the Unit 1 heater bay. The licensee determined that a ½-inch sensing line that taps into the main steam distribution header failed due to high cycle fatigue. The high cycle fatigue was caused from excessive vibrations over time that was a result of a failed pipe support. The licensee's corrective actions included replacing the failed portion of piping in addition to the adjacent isolation valve. The licensee also replaced the failed pipe supports and relocated the supports to a horizontal section of piping to prevent any potential for the supports to slip down the vertical portion of piping. The licensee additionally conducted an extent of condition review of susceptible small bore piping and did not identify any additional concerns on Unit 1. The licensee planned to conduct extent of condition reviews on Unit 2 during the next refueling outage in 2016.

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

b. Findings

No findings were identified.

.6 Annual Follow-up of Selected Issues: Residual Heat Removal Minimum Flow Valves Left in the Incorrect Position

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting RHR system minimum flow valves that were left in the incorrect position following surveillance testing. The licensee documented this issue in their CAP as IR 2513060. Following completion of QCIS 1000-16, "LPCI Pump discharge Flow Loop Transmitter Calibration," the licensee was to reposition valves MO 1-1001-18A and B in accordance with the current plant status. Procedure QCOP 1000-49, "Unit One RHR System Preparation for Standby Operation," Steps F.3.b and F.6.b. required valves MO 1-1000-18A and B to be verified in the open position during Modes 1, 2, and 3. The condition report documented the licensee's

operability basis and justification for the RHR system and described how RHR would have been capable of meeting its intended safety function with the valves in the incorrect (closed) position. The inspectors determined the position of these valves did not impact the operability of the RHR pumps; however, the inspectors questioned the licensee on the ability of the valves to meet their intended 10 CFR Part 50, Appendix R related function for a postulated fire event. After review of licensee documents, the inspectors determined the valves would have been capable of meeting their required Appendix R related function since the valves are only required to be available for use during a fire event. The inspectors determined the failure to reposition the valves to their correct standby lineup was a performance deficiency and contrary to licensee procedure QCOP 1000–49. The inspectors screened this issue in accordance with IMC 0612, Appendix B, “Issue Screening” and determined the performance deficiency was minor in accordance with IMC 0612, Appendix E, “Examples of Minor Issues,” since it was similar to example 4b because it was an insignificant procedural error and there were no safety consequences. Corrective actions taken by the licensee included repositioning the valves to their correct positions and initiating an apparent cause evaluation.

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

b. Findings

No findings were identified.

.7 Annual Follow-up of Selected Issues: Control Room Envelope Breach

a. Inspection Scope

During a review of items entered in the licensee’s CAP, the inspectors recognized a corrective action item documenting a breach in the control room envelope that occurred during inspection of fire dampers located within an access hatch that was considered a part of the control room envelope boundary. The licensee entered this issue into their CAP as IR 2506106. The condition report documented that while personnel were always available to administratively control the control room envelope boundary, they failed to recognize the potential for impairing the control room envelope boundary prior to performing the maintenance. The licensee failed to meet the requirements of Technical Specification 3.7.4, “Control Room Emergency Ventilation (CREV) System,” while the access hatch was opened and entered Condition C, for an inoperable CREV system due to an inoperable CREV boundary, upon receiving an alarm in the control room for “Control Room HVAC Train ‘A’ Trouble.” The condition was exited upon closure of the ventilation access hatch.

The licensee established QCMMS 4100–74, “Fire Damper Visual Inspection Surveillance,” and CC–AA–20, “Plant Barrier Control Program,” as the implementing procedures for control of impaired barriers and inspection of fire dampers impacting safety-related equipment. The licensee controlled the barrier impairment under plant barrier impairment, PBI–1879. The licensee failed to identify that PBI–1879 affected the ventilation barrier and was a performance deficiency. The inspectors screened this issue in accordance with IMC 0612, Appendix B, “Issue Screening,” and determined the performance deficiency was minor in accordance with IMC 0612, Appendix E, “Example of Minor Issues,” since it was similar to example 4b. While the impairment caused the

inoperability of the CREV system, personnel were always available in the immediate area to restore the control room envelope boundary and the breach only lasted for a few minutes. Corrective actions taken by the licensee included immediate restoration of the control room envelope boundary and initiating a root cause evaluation.

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

b. Findings

No findings were identified.

.8 Annual Follow-up of Selected Issues: Apparent Cause Evaluation for Issue Report 2472416: Reactor Core Isolation Cooling MO 1-1301-61 Failure

a. Inspection Scope

The inspectors reviewed the licensee's Apparent Cause Evaluation for a failure of RCIC motor operated valve (MOV) MO 1-1301-61 that was documented in IR 2472416. This event occurred on March 22, 2015, with the plant in Mode 2, during plant startup following refuel outage Q1R23. The inspectors identified one finding as described below.

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

b. Findings

Failure to Conduct Post Maintenance Testing following Manual Operation of Reactor Core Isolation Cooling Motor Operated Valve

Introduction: A finding of very low safety significance (Green) and associated NCV of TS Section 5.4.1 was self-revealed on March 22, 2015, for the licensee's failure to conduct PMT on RCIC MO 1-1301-61, following operation of the valve in the manual mode.

Description: On March 22, 2015, with Unit 1 in Mode 2 conducting a reactor startup from refuel outage Q1R23, operators in the Unit 1 RCIC room identified that the motor for MO 1-1301-61 (MO 61), RCIC turbine inlet valve, was running continuously and informed the control room. The RCIC system was required to be operable at the time of the event with the unit in Mode 2 and reactor pressure greater than 150 pounds per square inch gauge (psig). The licensee declared RCIC inoperable and entered TS 3.5.3, Condition A, for an inoperable RCIC system.

The licensee's investigation revealed that MO 61 had been placed into the manual mode of operation (disengaged the clutch) and closed during the refuel outage as part of a clearance order. When the clearance order was removed, the clutch for MO 61 was not manually engaged or tested electrically prior to entering Mode 2 for reactor startup, or prior to reaching 150 psig reactor pressure.



The licensee's procedure OP-AA-103-105, Step 4.2.2.4 stated:

Electrical operation of MOVs is required after placing a MOV in the manual operating mode as a Post Maintenance Test (PMT) to verify the return of the MOV to the electrical operating mode. This PMT is required to establish the MOV as "Operable" for remote operation. If a MOV is required to be "Operable" or "Available" for remote electrical operation while in the manual mode, additional testing may be required to demonstrate confidence in the ability of the actuator to transfer from manual to motor operation.

Licensee procedure MA-AA-716-012, Attachment 2, "MOV Post Maintenance Test Matrix," required a control room functional stroke to be performed whenever the valve actuator is placed in manual.

The inspectors interviewed operators with knowledge of the clearance order that verified the RCIC MO 61 valve handwheel was in the closed position. At the time the clearance order was executed, the electrical line up was in a configuration that prevented remote electrical operation and indication of RCIC MO 61 from the control room. Operators were required to place the valve in manual in order to verify the valve closed using the local handwheel. When the clearance order was finally removed, the licensee failed to identify that the valve required a PMT to stroke the valve electrically from the control room to verify proper operation.

Analysis: The inspectors determined that the failure to electrically operate MO 1-1301-61, RCIC turbine inlet valve, as a PMT following operation of the valve in the manual mode was contrary to licensee procedures MA-AA-716-012, "Post Maintenance Testing," Revision 20, and OP-AA-103-105, "Limitorque Motor-Operated and Chainwheel Operated Valve Operations," Revision 4, and was a performance deficiency.

The performance deficiency was determined to be more than minor and a finding because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and 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 was not able to ensure the operability of the RCIC system when they failed to conduct PMT on RCIC 1-1301-61. As a result, the RCIC system was inoperable.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors answered "No" to all questions in section A of Exhibit 2 and the finding screened as Green, or very low safety significance.

This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because the licensee did not maintain complete, accurate and up-to-date documentation. Specifically, following placing RCIC MO 61 in the manual mode of operation, the licensee failed to document the status of the valve which would have ensured operations performed the required PMT for the MOV after it was placed in the manual mode of operation [H.7].

Enforcement: Technical Specification Section 5.4.1 stated, in part, that “written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.”

NRC Regulatory Guide 1.33, Appendix A, Section 9 addresses “Procedures for Performing Maintenance,” and Section 9.e addresses “general procedures for the control of maintenance,”

Licensee procedure OP-AA-103-105, “Limitorque Motor-Operated and Chainwheel Operated Valve Operations,” Revision 4, Step 4.2.2.4 stated:

Electrical operation of MOVs is required after placing a MOV in the manual operating mode as a Post Maintenance Test (PMT) to verify the return of the MOV to the electrical operating mode. This PMT is required to establish the MOV as “Operable” for remote operation. If a MOV is required to be “Operable” or “Available” for remote electrical operation while in the manual mode, additional testing may be required to demonstrate confidence in the ability of the actuator to transfer from manual to motor operation.

Licensee procedure MA-AA-716-012, “Post Maintenance Testing,” Attachment 2, “MOV Post Maintenance Test Matrix,” Revision 20, requires a control room functional stroke to be performed whenever the valve actuator is placed in manual.

Contrary to the above, from March 22–23, 2015, the licensee failed to implement Step 4.2.2.4 of procedure OP-AA-103-105 and Attachment 2 of procedure MA-AA-716-012. Specifically, following the operation of RCIC MO 1-1301-61 in the manual mode for a clearance order, the licensee failed to electrically operate, or otherwise conduct a PMT to ensure the operability of the RCIC system.

Immediate corrective actions included manually engaging the motor clutch for RCIC MO 1-1301-61 and electrically stroking the valve to verify proper operation. The licensee also determined the valve was operable but degraded and planned future repairs to the valve actuator for the automatic clutch mechanism. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

The violation was entered into the licensee’s CAP as IR 2472416.

**(NCV 05000254/2015002-01; 05000265/2015002-01, Failure to Conduct Post Maintenance Testing Following Manual Operation of RCIC MOV)**

.9 Annual Follow-up of Selected Issues: Root Cause Evaluation for IR 2468511: Individual Working on Bus 12 Contacted Energized Equipment

a. Inspection Scope

The inspectors reviewed the licensee’s Root Cause Evaluation for an event that occurred on March 14, 2015, when a contract electrician was injured after coming into contact with an energized 4160 V Bus component, which was documented in IR 2472416.

The inspectors reviewed the nuclear safety aspects of this event and identified one issue of concern that is documented as a finding below.

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

b. Findings

Inadequate Zone of Protection for Electrical Bus Maintenance

Introduction: A finding of very low safety significance (Green) was self-revealed on March 14, 2015, for the licensee's failure to implement a clearance order for electrical maintenance on Bus 12, Cubicle 9, that provided a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection, as required by licensee procedure OP-AA-109-101, "Clearance and Tagging," Revision 10.

Description: On March 14, 2015, a contract electrical worker received an electrical shock while performing electrical maintenance on Unit 1 4160 V Bus 12, Cubicle 9. The licensee documented the issue in their CAP as IR 2468511, "Individual Working on Bus 12 Contacted Energized Equipment," and conducted a root cause investigation into the event. There were several root and contributing causes to this event. In general, the licensee identified that there were breakdowns in the execution of electrical work safety practices and in identification of an adequate zone of protection for Bus 12, Cubicle 9.

Licensee Procedure OP-AA-109-101, Step 1.2.5 stated, "The requirements of this procedure shall be met to protect against potential hazards to personnel safety from plant systems during physical work on a system;" and Step 7.1.2 states, "Clearance orders will provide a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection. This is accomplished by identifying, isolating, and tagging all required isolation points."

As identified in the licensee's root cause investigation, there were several breakdowns in electrical safety practices that led to this event. The inspectors determined the licensee failed to meet the requirements of OP-AA-109-101, and the failure to meet those requirements was within the licensee's ability to foresee and correct and therefore was a performance deficiency.

Analysis: The inspectors determined that the licensee's failure to provide a safe zone of protection for all physical work that was performed or for required equipment protection as part of the clearance order (under WO 1812782) for performing electrical bus maintenance on Bus 12, Cubicle 9, was contrary to procedure OP-AA-109-101, "Clearance and Tagging," Revision 10, and was a performance deficiency.

The finding was determined to be more than minor because the finding, if left uncorrected, could become a more significant safety concern. Specifically, the failure to properly control and de-energize equipment prior to performing maintenance could have an impact on safety-related equipment (including equipment damage and potential loss of offsite power).

The inspectors also determined this finding was associated with the Initiating Events Cornerstone attribute of Configuration Control and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012. Because the finding impacted the Initiating Events Cornerstone and Unit 1 was shut down at the time of the event, the inspectors determined the finding could be further evaluated using Appendix G. The inspectors answered "No" to all questions in Exhibit 2 of IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," dated May 9, 2014, and determined the finding was of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Work Management because the licensee did not implement a process of planning, controlling and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee failed to plan, control, and execute a clearance order that provided a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection during maintenance on Bus 12, Cubicle 9 [H.5].

Enforcement: TS Section 5.4.1 states, in part, that "written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978."

NRC Regulatory Guide 1.33, Appendix A, Section 1 addresses "Administrative Procedures," and Section 1.c, addresses "Equipment Control (e.g. Locking and Tagging)."

Licensee procedure OP-AA-109-101, "Clearance and Tagging," Revision 10, Step 7.1.2 states, "Clearance orders will provide a safe zone of protection for all physical work to be performed under the clearance order or for required equipment protection. This is accomplished by identifying, isolating, and tagging all required isolation points."

Contrary to the above, on March 14, 2015, the licensee failed to implement Step 7.1.2 of procedure OP-AA-109-101. Specifically, the clearance order for maintenance on Bus 12, Cubicle 9, failed to provide a safe zone of protection for all physical work that was performed or for required equipment protection as part of the clearance order (under WO 1812782). Immediate corrective actions included stopping all electrical work and verifying electrical work boundaries prior to re-commencing work.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's CAP as IR 2468511. **(NCV 05000254/2015002-02; 05000265/2015002-02, Inadequate Zone of Protection for Electrical Bus Maintenance)**

#### 40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

##### .1 (Closed) Licensee Event Report 05000265/2015-001: Unit 1 HPCI Watertight Door Found Open Results in Unit 2 HPCI Inoperability

On March 5, 2015, the inspectors identified that the Unit 1 HPCI watertight door was open with no person in attendance. This condition challenged the internal flood protection for the Units 1 and 2 HPCI rooms because the rooms do not have a flood

barrier separating them. At the time the condition was identified, only Unit 2 HPCI was required to be operable per TS (Unit 1 was in Mode 5). This condition resulted in an unplanned inoperable condition of the Unit 2 HPCI system. The inspectors immediately closed the water tight door prior to informing the control room. The licensee documented this condition in IR 2464065. The licensee also conducted briefings with the workforce and instituted additional monitoring of the water tight doors for several days following this event. Licensee procedure QCAP 0250-06, "Control of In-Plant Flood Barriers and Watertight Submarine Doors," Revision 13, requires, in part, that individuals passing through the watertight doors are responsible for ensuring the doors are shut after passage. In addition, the procedure requires that administrative controls are put in place if the doors are going to be left open for a time longer than required for normal passage, including having a person staged to shut the door if needed. The failure to meet the requirements of QCAP 0250-06 was a performance deficiency. However, the performance deficiency was minor, due to the large amount of personnel in the reactor building performing outage activities causing the door to most likely be open for only a short period of time. Unit 2 HPCI, while inoperable, remained available and was always able to perform its safety function. Documents reviewed are listed in the Attachment to this report. This licensee event report (LER) is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.2 (Closed) Licensee Event Report 05000254/265 2015-002: HPCI Interlock Doors Opened Simultaneously Cause Loss of Secondary Containment

On February 10, 2015, the licensee identified that both the doors in the secondary containment interlock between the reactor building Unit 1 HPCI room and the Unit 1 turbine building were momentarily opened simultaneously, causing the licensee to declare secondary containment inoperable. The licensee entered the unplanned TS LCO for this issue and closed the doors immediately to reestablish secondary containment. Although the licensee discovered this failure to meet TS, the inspectors determined this issue was minor because secondary containment pressure remained negative throughout the condition. The cause of the door failure was a bent locking bolt that prevented the door plungers to engage and allowed the door to open with the opposite interlock door opened. The licensee repaired the locking bolt mechanism and aligned the door properly. Documents reviewed are listed in the Attachment to this report. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.3 (Closed) Licensee Event Report 05000254/2015-003: Main Steam Isolation Valve Local Leak Rates Exceed Technical Specification Limits

On March 2, 2015, with Unit 1 shut down for refuel outage Q1R23, the licensee identified that the as-found local leak rate tests (LLRT) for the 'D' main steam line (MSL) main steam isolation valves (MSIVs) and the combined total leakage of all MSLs exceeded the minimum pathway criteria (smaller leakage in a line and combined total of the smaller leakage in each line, respectively) of the TS. The minimum pathway leakage for the 'D' MSL exceeded the TS surveillance limit of 34 standard cubic feet per hour (scfh), with a measured leakage of 64.3 scfh (This was for the 1D MSIV. The 2D MSIV had an as-found leakage of 69.5 scfh). The measured combined total leakage of all MSLs was measured at 92.26 scfh, which exceeded the TS limit of 86 scfh for all MSIVs combined

min-pathway leakage. After reviewing the as-found test results, the licensee flushed the MSIs to determine if any of the failures could be attributed to foreign material and to identify a scope for inspection and repair. Based on the post-flush test results, the licensee determined MSIVs 1-0203-1B, 1-0203-2D and 1-0203-1C were to be added to the scope of inspection and repair for 1QR23. The three MSIVs were successfully repaired and retested with satisfactory results, and all of the as-left LLRT results were satisfactory. The inspectors reviewed historical test results and valve leakage trend information and determined that the LLRT failures were not within the licensee's ability to foresee therefore, no performance deficiency was identified. The licensee planned to replace MSIV plugs with an improved spherical nose plug during future outages.

Documents reviewed are listed in the Attachment to this report. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.4 (Closed) Licensee Event Report 05000254/2015-005: Manual Scram Due to Steam Leak on Turbine Throttle Pressure Sensing Line

On April 2, 2015, with Unit 1 operating at full power, operators in the control room received an alarm indicating two of three turbine throttle pressure transmitters on Unit 1 had failed low. The control room also received reports from the field that operators could hear indications of a steam leak in the Unit 1 heater bay. Operators reduced power to 20 percent and secured the main turbine in an attempt to isolate the leak. Securing the main turbine failed to isolate the steam leak, so operators inserted a manual scram and manually closed the MSIVs. Operators used relief valves to control reactor pressure and cooldown once the MSIVs were closed. During operation of one of the relief valves, operators identified a corresponding drywell pressure rise which was later identified to be due to a stuck open relief valve tailpipe vacuum breaker. Operators closed the relief valve and started an additional drywell cooler which caused the drywell pressure to return to normal. The licensee later replaced both the relief valve (as a precautionary measure – the relief valve was later inspected satisfactorily) and the tailpipe vacuum breaker, which was identified to have damaged mechanical hardware, including springs, bushings and operating arms.

The steam leak in the heater bay was identified to be due to a fatigue crack and failure of the turbine throttle pressure sensing line. The licensee replaced the failed sensing line and its associated degraded supports, in addition conducted extent of condition walkdowns on small bore piping inside the heater bay and planned future inspections on Unit 2 inaccessible small bore piping. The inspectors determined that this issue was not within the licensee's ability to foresee because the pressure sensing line was not normally inspected when the reactor was operating. As a result, no performance deficiency was identified. Documents reviewed are listed in the Attachment to this report. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153-05.

.5 (Closed) Licensee Event Report 05000254/265 2015-006: Interlock Doors Opened Simultaneously Cause Loss of Secondary Containment

On April 28, 2015, the licensee identified that both doors in the secondary containment interlock between the Unit 1 reactor building and the Unit 1/2 EDG room were

momentarily opened simultaneously, causing the licensee to declare secondary containment inoperable. The doors were immediately closed, and secondary containment was reestablished and declared operable. The inspectors determined that the inoperability of secondary containment was a minor issue because the secondary containment pressure remained negative while both doors were open. The cause of the door failure was a failure of the Unit ½ EDG room door latch that allowed the electrical interlock to be satisfied, but not secure the door shut. Corrective actions included administratively controlling the interlock and planning replacement of the door and modifying the single point vulnerability of the door. Documents reviewed are listed in the Attachment to this report. This LER is closed.

This event follow-up review constituted one sample as defined in IP 71153–05.

#### 40A5 Other Activities

##### .1 (Closed) Temporary Instruction 2515/190, Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations

###### a. Inspection Scope

The inspectors independently verified that the Quad Cities staff's proposed interim actions would perform their intended function for flooding mitigation by performing the following:

- Visual inspection of the flood protection feature if the flood protection feature was relevant.
- External visual inspection for indications of degradation that would prevent the flood protection features credited function from being performed was performed.
- Reasonable simulation, if applicable, to the site.
- Flood protection feature functionality was determined using either visual observation or by review of other documents.

###### b. Findings

In a letter from the Quad Cities Nuclear Power Station to the NRC, dated June 4, 2014, the licensee described the interim actions that had been taken or were planned associated with the Flooding Hazard Reevaluation Report, dated March 12, 2013. Interim Action #4 stated that the licensee would develop and implement appropriate operational response procedures to mitigate the effects of the Local Intense Precipitation (LIP) Event. The licensee developed and implemented QCOA 0010–22, "Local Intense Precipitation Response Procedure," Revision 1, for this purpose. In the June 4, 2014, letter the licensee stated that Interim Action #4 was completed on March 14, 2013.

The inspectors reviewed the LIP Evaluation LIP–QDC–002, Revision 0, Section 7.3, in the fourth quarter of 2014. This evaluation identified that the water level after a LIP would be about 2–3 feet above ground level at the entrance to the reactor building. Without flood barriers the water would enter the building and fill the rooms that contain the emergency core cooling system pumps and cause most, if not all, of the electrical distribution system to fail which could potentially lead to core damage. At the time of the inspection in the fourth quarter of 2014, the licensee had not completed installing any

flood barriers. The inspectors reviewed QCOA 0010–22 and determined that the procedure, as written at that time, would not have mitigated the effects of a LIP event that resulted in a water level 2–3 feet above ground level without flood barriers installed.

The installation of flood barriers was expected to be addressed by the licensee by the implementation of the flood FLEX strategy which was completed by March 2015. The inspectors determined that Temporary Instruction (TI)–190 would remain open until the flood barriers were installed and inspected to verify that QCOA 0010–22 would mitigate the effects of a LIP event. This was documented in Integrated IR 05000254/2014005; 05000265/2014005.

On June 15–18, 2015, the inspectors reviewed QCOA 0010–22, “Local Intense Precipitation Response Procedure,” Revision 3, walked down the installed flood barriers, and walked down the modifications made to the turbine building and reactor building roofs. In addition, the inspectors interviewed the system engineer and two senior reactor operators. The inspectors identified some minor issues which the licensee captured in IR 02516240,”TI–190, NRC Observations On LIP Mitigation.”

This TI is closed.

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On July 7, 2015, the inspectors presented the inspection results to Mr. S. Darin, 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:

- On May 22, 2015, the inspectors presented the results of the triennial heat sink performance inspection to Mr. K. Ohr, Plant Manager, 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.
- On June 12, 2015, the inspectors presented the results of the radioactive solid waste processing and radioactive material handling, storage, and transportation inspection with Mr. K. Ohr, Plant Manager, 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.

ATTACHMENT: SUPPLEMENTAL INFORMATION



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

S. Darin, Site Vice President  
K. Ohr, Plant Manager  
W. Beck, Regulatory Assurance Manager  
T. Bell, Engineering  
R. Craddick, Chemistry Manager–Developmental  
H. Dodd, Operations Director  
S. Flaker, Operations Services Manager  
J. Friedrichsen, NOS Lead Assessor  
M. Graham, Shift Manager  
T. Petersen, Regulatory Assurance Lead  
T. Scott, Work Management Director

#### NRC

J. McGhee, Acting Chief, Reactor Projects Branch 1  
R. Murray, Senior Resident Inspector  
K. Carrington, Resident Inspector

#### Illinois Emergency Management Agency (IEMA)

C. Mathews, IEMA  
C. Settles, IEMA

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

- |   |     |   |
|---|-----|---|
| 05000254/2015002-01;<br>05000265/2015002-01 | NCV | Failure to Conduct Post-Maintenance Testing Following Manual Operation of RCIC MOV (Section 4OA2.8) |
| 05000254/2015002-02;<br>05000265/2015002-02 | NCV | Inadequate Zone of Protection for Electrical Bus Maintenance (Section 4OA2.9)                       |

### Closed

- |  |     |   |
|--|-----|---|
| 05000254/2015002-01;<br>05000265/2015002-01            | NCV | Failure to Conduct Post-Maintenance Testing Following Manual Operation of RCIC MOV (Section 4OA2.8)   |
| 05000254/2015002-02;<br>05000265/2015002-02            | NCV | Inadequate Zone of Protection for Electrical Bus Maintenance (Section 4OA2.9)   |
| 05000265/2015-001                                      | LER | Unit 1 HPCI Watertight Door Found Open Results in Unit 2 HPCI Inoperability (Section 4OA3)  |
| 05000254/2015-002;<br>05000265/2015-002                | LER | HPCI Interlock Doors Opened Simultaneously Cause Loss of Secondary Containment (Section 4OA3)   |
| 05000254/2015-003                                      | LER | Main Steam Isolation Valve Local Leak Rates Exceed Technical Specification Limits (Section 4OA3)  |
| 05000254/2015-005                                      | LER | Manual Scram Due to Steam Leak on Turbine Throttle Pressure Sensing Line (Section 4OA3)   |
| 05000254/2015-006;<br>05000265/2015-006<br>TI 2515/190 | LER | Interlock Doors Opened Simultaneously Cause Loss of Secondary Containment (Section 4OA3)<br>Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations (Section 4OA3) |

## 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.

**Key:**

EC     Engineering Change  
 FZ     Fire Zone  
 IR     Issue Report  
 WO     Work Order

<b><u>Section Number</u></b>	<b><u>Document Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Revision or Date</u></b>
1R01	OP-AA-102-102	General Area Checks and Operator Field Rounds	13
1R01	OP-AA-108-207-1001	Station Response to Grid Capacity Conditions	6
1R01	OP-AA-108-107	Switchyard Control	4
1R01	OP-AA-108-107-1002	Interface Procedure Between ComEd/PECO and Exelon Generation (Nuclear/Power) for Transmission Operations	8
1R01		Daily Order/ Standing Order	04/23/2015; 04/24/2015
1R01	SPOG: 1-3	Generating Station Stability	4
1R01	SPOG: 1-3-C	Station 4, Quad Cities Units 1 and 2 Special Protection System	9
1R01	QOS 6400-01	345KV Yard Weekly Inspection	57
1R01	QCOP 6400-35	Performing Transmission Switching Orders	5
1R01	WC-AA-8003	Interface Procedure Between ComEd/PECO and Exelon Generation (Nuclear/Power) for Design Engineering and Transmission Planning Activities	5
1R01	Operating Experience Smart Sample (OpESS) 2012/01	High Wind Generated Missile Hazards	12/29/2011
1R01	QCOA 0010-10	Tornado Watch/Warning Severe Thunderstorm Warning, or Severe Winds	30
1R01	IR 2512572	Summer Readiness Contingency for Degraded Compressor	06/10/2015
1R01	IR 2510132	Summer Readiness Items Unavailable for 6/1 Commitment	06/04/2015
1R01	IR 2507474	U-1 Battery Room HVAC, 1-5741-601, Not Cooling Adequately	05/29/2015
1R01	IR 2507805	Unit 2 EDG Room Temperature Indication	05/31/2015

1R01	IR 2495933	NOS ID: Summer Readiness Concern	05/05/2015
1R01	IR 2485809	2C Circ Pp Motor Thrust Brg Temp Reading 186 Degrees	04/15/2015
1R01	IR 1478946	Summer Readiness Package Review Issues	02/22/2013
1R01	IR 1517146	Lack of Urgency to Resolve Equipment Deficiency	05/23/2013
1R01	IR 1531122	Quad Cities Summer Execution Plant Status Report Not Sent	07/01/2013
1R01	IR 1536778	North Triangle Bay Separation Screen Coating Degrading	07/17/2013
1R01	IR 1536780	South Triangle Separation Screen Coating Degrading	07/17/2013
1R01	IR 1560083	Summer Readiness Critique Identifies Positive Practice	09/17/2013
1R01	IR 2400244	Degradation of 2A Traveling Screen Lower Bushings & Baskets	10/23/2014
1R01	IR 2450388	WANO ID: 2C CW Pump Discharge Vlv Junction Box Needs Replaced	02/10/2015
1R01	IR 2472825	IR For Tracking Critical Spare Usage	03/23/2015
1R01	IR 1666114	2014 Summer Readiness Recommendation Not Implemented	05/30/2014
1R01	IR 1674224	LI 2-0263-151B IR 1673426 Follow Up	06/23/2014
1R01	IR 1682006	NOS ID: Adverse Trend in Ventilation Issues	07/15/2014
1R01	IR 2388191	2015 Quad Cities Summer Readiness Actions	09/30/2014
1R01	QC-AA-107	Seasonal Readiness	14
1R01	IR 2413616	A Contingency WO Needed for 1A IPBD Blower Contactor	11/18/2014
1R01	IR 2413622	A Contingency WO Needed for 2A IPBD Blower Contactor	11/18/2014
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1R01	IR 2485741	2A Traveling Screen Guide Rails Severely Degraded	04/15/2015
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1R07T	IR 01361697	1B RHR Pump Mech Seal Cooler Bolted Flange Has 15 DPM Leak	05/02/2012
1R07T	IR 01411326	Water on Tube Side of EDG Hx Even Though Tube Side was on a Nitrogen Purge	09/10/2012
1R07T	IR 01422621	EDG HX 0-6661-B Requires Replacement	10/02/2012
1R07T	IR 01422623	EDG HX 0-6661-A Requires Replacement	10/02/2012
1R07T	IR 01494682	1B RHR Seal Cooler has Degraded RHRSW Flow	03/29/2013
1R07	IR 01617892	Through Wall Leak Line 2-10116B-2"-D 2B RHRSW Cubicle Cooler	02/06/2014
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1R07T	IR 02424595	Moderate Corrosion on 2A RHRSW Pump Casing Bolts	12/12/2014
1R07T	IR 02492384	NRC Questions 1B RHR Seal Cooler Compliance with CLB	04/28/2015
1R07T	IR 02502372	Corrosion on U2 EDGCW Pump Casing Bolts Identified During Pre-NRC Walkdown	05/18/2015
1R07T	IR 02502386	Moderate U2 EDGCW Pump Bearing Housing Surface Corrosion Identified During Pre-NRC Walkdown	05/18/2015
1R07T	IR 02502965	NRC ID: Note Missing from Drawing M-37A	05/19/2015
1R07T	IR 02503518	NRC UHS Inspector Identified Moderate Corrosion on 1C RHRSW High-Pressure Pump Discharge Flange Spacer	05/20/2015
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1R07T	IR 02503839	IST Bases Document for 1(2)-1001-269/270 Incorrect	05/21/2015
1R07T	IR 02504135	NRC-Identified 1B RHRSWP Motors' Safety Guards were Bent Away from Motor	05/19/2015
1R07T	IR 02504158	NRC Identified Paint Flaking During Inspection	05/21/2015
1R07T	IR 02504161	Corrosion Was Identified by NRC During Inspection of DGCW	05/21/2015
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1R07T	IR 02504197	NRC-Identified Corrosion on 1A RHR Pump Vent Line	05/21/2015
1R07T	IR 02504216	2015 UHS Inspection: Conflicting EDGCW Acceptance Criteria	05/21/2015
1R07T	IR 02504224	UHS Inspection—Piping Classification Needs Review	05/21/2015
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1R07T	EC 387980	Determine Tube Fouling Limit for Wiegmann and Rose EDG	03/08/2012
1R07T	FE 71497	Part Evaluation of RHR Pump Seal (1446257-1) with Tungsten Carbide Facing	02/10/2011
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1R07T	IST-QDC-BDOC-V-07	Quad Cities—Inservice Testing Bases Document	08/20/2014
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1R07T	WO 01476989	Installed New Unit 1/2 EDG Wiegmann and Rose Hxs CAT ID 1443867	09/10/2012
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1R07T	WO 01300691-01	DGCW Pump Group B Flow (IST)	03/01/2010
1R07T	WO 01354259-01	DGCW Pump Comprehensive Test (IST)	10/03/2011
1R07T	WO 01359741-01	IN Q2R21, Perform G-Scan Exam of 2B RHRSW Suction Header	07/31/2012
1R07T	WO 01531191-01	DGCW Pump Comprehensive Test (IST)	10/03/2013
1R07T	WO 01538125-01	DGCW Pump Comprehensive Test (IST)	10/23/2013
1R07T	WO 01559358-01	DGCW Pump Group B Flow (IST)	10/24/2012
1R07T	WO 01572170-01	DGCW Pump Group B Flow (IST)	12/04/2012
1R07T	WO 01586147-01	DGCW Pump Group B Flow (IST)	01/23/2013
1R07T	WO 01597862-01	DGCW Pump Group B Flow (IST)	03/06/2013
1R07T	WO 01602107-01	Inspect Concrete for Buried Pipe Program 2013	08/16/2013
1R07T	WO 01610623-01	DGCW Pump Group B Flow (IST)	04/21/2013
1R07T	WO 01621869-01	DGCW Pump Group B Flow (IST)	06/06/2013
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1R07T	WO 01747271-01	DGCW Pump Group B Flow (IST)	09/16/2014
1R07T	WO 01750467-01	RHR Service Water Pump C Flow (IST)	09/23/2014

1R07T	WO 01754873-01	1-3999-88/2-3999-139 Check Valve Testing (IST)	10/07/2014
1R07T	WO 01760350-01	RHR Service Water Pump A Flow (IST)	10/29/2014
1R07T	WO 01770680-01	DGCW Pump Group B Flow (IST)	12/18/2014
1R07T	WO 01772366	Clean and Coat NRC-Identified Moderate Corrosion on 1C RHRSW High-Pressure Pump Discharge Flange Spacer	planned
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2RS8	AR 1649758	Transfer Line Plugged From Radwaste	04/20/2014
2RS8	AR 1667915	Nuclear Oversight Identified: Incorrect Torque Wrench Used for Radwaste Cask	06/04/2014
2RS8	AR 1668551	B-Radwaste Floor Drain Sump Non-Functional	06/06/2014
2RS8	AR 2399983	Cask Tie Down Cable Inspection	10/21/2014
2RS8	AR 2426087	Check-in-Self-Assessment: NRC Inspection 71124.08	05/11/2015
2RS8	AR 2454270	Radwaste Valve Isle Floor Drain Clogged	02/17/2015
2RS8	RP-AA-100	Process Control Program for Radioactive Wastes	10

2RS8	RP-AA-102	Radwaste Storage Facility/Dry Active Waste Container Inspections	5
2RS8	RP-AA-104	Radwaste Storage Facility/Waste Container Inspections	5
2RS8	RP-AA-503	Unconditional Release Survey	9
2RS8	RP-AA-600	Radioactive Material/Waste Shipments	13
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2RS8	RP-AA-600-1009	Shipment of Category 2 Quantities of Radioactive Material or Waste (Category 2 RAMQC)	
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2RS8	QCOP 2050-09	Transfer of Cleanup Phase Separator Sludge to the Solidification System Mixing Tank	22
2RS8	QCOP 2050-10	Interim Radwaste Storage Facility; General Operation Procedure	24
2RS8	QCOP 2050-11	Determining Placement of Containers in the Interim Radwaste Storage Facility	1
2RS8	QCOP 2099-01	Transfer, Dewatering and Flush of Radwaste Mixing Tank Using a Contractor Supplied Dewatering System	37
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2RS8	QC-13-067	Powdex Resin to Clive	10/08/2013
2RS8	QC-14-058	Shipping Package Trinuke Filters to Clive	09/11/2014
2RS8	QC-14-069	Reactor Water Cleanup Resins to Clive	10/21/2014
2RS8	QC-14-070	Reactor Water Cleanup Resins to Clive	10/28/2014
2RS8	QC-14-101	Dry Active Waste to Bear Creek	04/11/2014
2RS8	QC-14-317	Unit 2 Refuel Mast to Wilmington	02/21/2014
2RS8	LIMS L59231	Teledyne Brown Report of Analysis for Part 61 Compliance	08/01/2014
2RS8		Quad Cities Updated Final Safety Analysis Report, Section 11	13
4OA1	LS-AA-2100	Monthly Data Elements for NRC Reactor	5

		Coolant System (RCS) Leakage	
4OA1		PI Data 2014	12/31/2013– 12/31/2014
4OA1		PI Data 2015	12/31/2014– 12/31/2015
4OA1	LS-AA-2100	Monthly Data Elements for NRC Reactor Coolant System (RCS) Leakage	5
4OA1	QCOS 1600-07, Attachment A	Drywell Equipment Drain Sump Leakage Data Sheet	04/01/2014– 05/01/2015
4OA1	QCOS 1600-07, Attachment B	Drywell Floor Drain Sump Leakage Data Sheet	04/01/2014– 05/01/2015
4OA2	IR 2484366	NRC Inquiry on Piping And Cable Trays	04/13/2015
4OA2	ACE 2446141-02	Common Cause ACE Requested for DC Grounds	03/17/2015
4OA2	IR 2477988	Malfunction Impacting Five CR Alarm Tiles	04/01/2015
4OA2	IR 2480279	U2 EDG Starting Air Solenoid Valve Leaking Air	04/06/2015
4OA2	IR 2480497	ACE 2446141 ID DC Ground at 1-2301-5 Valve was not Resolved	04/06/2015
4OA2	IR 2483033	QGAs (EOPs) were Revised without Corresponding EAL Revision	04/29/2015
4OA2	IR 2492034	Rebuild 1-1301-61 Actuator	04/28/2015
4OA2	IR 2492022	Perform Off-Line Baker Testing of 1-1301-61 Actuator Motor	04/28/2015
4OA2	IR 2488587	Classify U1 HPCI Steam Event as a Configuration Control Event	04/21/2015
4OA2	RCR 2443241-04	Operations Aggregate Performance Root Cause	04/10/2015
4OA2	ACE 2471912	Unexpected U1 Reactor Building Vent Radiation Monitor Channel (1-1705-8A) A High Alarm	05/19/2015
4OA2	RCR 2479120	Unit 1 Manual SCRAM Due to Unisolable Steam Leak on D-Ring Header	05/15/2015
4OA2	Drawing 4E-1350B	Diesel Generator 1 Auxiliaries and Start Relays	AN
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4OA2	QCOS 6600-54	Emergency Diesel Generator TD-5 Time Delay Relay Testing	4
4OA2	IR 2511923	Eval U2 SBLC Squib Vlv Cables For Min Bend Radius	06/15/2015
4OA2	IR 2511923	Eval U2 SBLC Squic Vlv Cables for Min Bend Radius	06/08/2015
4OA2	IR 2505370	1B ASD Speed Hold	05/26/2015

4OA2	IR 2498438	Unexpected Control Room Alarm 912-1 F1 RBCCW Tank High Level	05/14/2015
4OA2	M-99-4 (E-4)	To Hydrogen Verification Autoclave 2202-85B	
4OA2	IR 2472107	U1 ADS Relays Need Contacts Burnished	03/21/2015
4OA2	IR 2516072	NRC Question Posed on U-2 EDG Operability	06/17/2015
4OA2	IR 2507805	Unit 2 EDG Room Temperature Indication	05/31/2015
4OA2	Drawing M-813	Diesel Ventilation System	C
4OA2	Calculation QDC-5700-H-1567	Diesel Generator Room Ventilation	0
4OA2	QCOA 6600-08	Unit 1(2) Diesel Generator Room Vent Fan Failure	11
4OA2	QCOA 6600-08	Unit 1(2) Diesel Generator Room Vent Fan Failure	Temporary Change (TIC) 3312
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4OA2	Drawing M-725, Sheet 3	Piping and Instrument Diagram Control Room HVAC	AG
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4OA2	ANSI/ANS 3.2-1988	Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants	1988
4OA2	SE-98-049	10 CFR 50.59 Safety Evaluation- RHR Pump Minimum Flow Line Valve EPNs: MO-1001-18A, B	04/13/1998
4OA2	IR 2513060	RHR Min Flow Valves 1-1001-18A/B Found Out of Position	06/10/2015
4OA2	EC 401570	Operability Evaluation: RCIC Turbine Steam Supply Motor Operated Valve 1-1301-61 Clutch Assembly is Degraded (Issue Report 02472416)	03/25/2015
4OA2	ER-AA-321-1008	Inservice Testing of Motor Operated Valves	2
4OA2	OP-AA-103-105	Limiter Motor-Operated and Chainwheel Operated Valve Operations	4
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4OA3	IR 2450376	HPCI interlock Doors Open Simultaneously	02/10/2015
4OA3	IR 2462135	Q1R23 PSU Inbd MSIV 1-0203-1A Exceeded TS Limit	03/02/2015
4OA3	IR 2462140	PSU Q1R23 Inbd MSIV 1-0203-1B Exceeded TS Limit	03/02/2015
4OA3	IR 2462142	PSU Q1R23 Inbd MSIV 1-0203-1C Exceeded TS Limit	03/02/2015
4OA3	IR 2462145	PSU Q1R23 Oubd MSIV 1-0203-2D Exceeded TS Limit	03/02/2015



4OA3	IR 2462146	PSU Q1R23 Inbd MSIV 1-0203-1D Exceeded TS Limit	03/02/2015
4OA3	IR 2462184	PSU Q1R23 MSIV Min-Path Leakage Exceeded TS Limit	03/03/2015
4OA3	IR 2518868	U2 EHC Level Trend Indicates Possible Leak	06/24/2015
4OA3	IR 2519038	EHC Fluid Leak in U2 LPHB	06/24/2015
4OA3	IR 2519217	U2 EHC Leak Possibly Identified	06/24/2015
4OA3	IR 2420336	EHC Leak is Identified to CV-4	06/26/2015
4OA3	EC 336494	Provide Guidance for Isolation of Control Valve Accumulators	05/14/2002
4OA3	QCAN 901(2)-7 B-6	Abnormal EHC Fluid Reservoir Level	6
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4OA3	Drawing M-2022, Sheet 1	Diagram of EHC Hydraulic Power Unit Piping	T
4OA5	B-698, Sheet 2	Local Intense Precipitation Flood Barrier Details	05/28/2014
4OA5	EC 393258	Evaluate the Effects of the Local Intense Precipitation (LIP) and the River Flood Event—Fukushima	1
4OA5	AR 1669629-09	Tasks Associated with EC 396297	
4OA5	IR 2426873	NRC Concern Needs Further Evaluation	
4OA5	WO 1747018-17	Installation of Barrier #10 (Service Building Door Into U1 TB)	

## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CREV	Control Room Emergency Ventilation
DG	Diesel Generator
DGCW	Diesel Generator Cooling Water
EC	Engineering Change
EDG	Emergency Diesel Generator
EHC	Electrohydraulic Control
FOTP	Fuel Oil Transfer Pump
FZ	Fire Zone
HPCI	High Pressure Coolant Injection
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
LER	Licensee Event Report
LIP	Local Intense Precipitation
MOV	Motor-Operated Valve
MSIV	Main Steam Isolation Valve
MSL	Main Steam Line
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
PI	Performance Indicator
PMT	Post-Maintenance Testing (Test)
psig	Pounds Per Square Inch Gauge
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SBLC	Standby Liquid Control
SBO	Station Blackout
scfh	Standard Cubic Feet Per Hour
SDP	Significance Determination Process
SSC	Systems, Structures, and Components
TI	Temporary Instruction
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
WO	Work Order

B. Hanson

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Sincerely,

**/RA/**

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

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