



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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October 30, 2014

Mr. Michael J. Pacilio
Senior VP, Exelon Generation Co., 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 05000254/2014004;
05000265/2014004

Dear Mr. Pacilio:

On September 30, 2014, 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 October 7, 2014, with Mr. S. Darin, and other members of your staff.

Based on the results of this inspection, two NRC-identified 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. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with 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.

M. Pacilio

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

Sincerely,

/RA/

Christine A. Lipa, Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
IR 05000254/2014004; 05000265/2014004
w/Attachments: Supplemental Information
Inspection Checklist

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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: 05000254/2014004; 05000265/2014004

Licensee: Exelon Generation Company, LLC

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

Location: Cordova, IL

Dates: July 1 through September 30, 2014

Inspectors: R. Murray, Senior Resident Inspector
J. Boettcher, Acting Resident Inspector
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Approved by: Christine A. Lipa, Chief
Branch 1
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report 05000254/2014004; 05000265/2014004; 07/01/2014 - 09/30/2014; Quad Cities Nuclear Power Station, Units 1 and 2; Operability Evaluations, Emergency Preparedness.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. The findings were considered non-cited violations (NCV) of 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 January 1, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated July 9, 2013. 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: Mitigating Systems/Barrier Integrity

- Green. A finding of very low safety significance (Green) and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the licensee's failure to evaluate the impact of a conduit support installed in close proximity of the Unit 2 torus shell. Specifically, during installation of the conduit support, the licensee failed to provide instructions to ensure that sufficient clearance from the torus shell was provided to accommodate the torus wall movements predicted in the Updated Final Safety Analysis Report (UFSAR) torus design basis load cases. Immediate corrective actions included performing an operability evaluation under Issue Report (IR) 1672301 that determined the torus remained operable under all design basis events. The licensee has also corrected the condition by cutting the conduit support to ensure sufficient clearance to the torus wall is maintained.

The performance deficiency was determined to be more than minor because the finding was associated with the design control attribute of both the Mitigating Systems and Barrier Integrity Cornerstones. The finding adversely affected the Mitigating Systems cornerstone attribute of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding also adversely affected the Barrier Integrity Cornerstone objective of providing reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. The inspectors determined the finding screened as very low safety significance (Green) because the licensee's operability evaluation determined the torus remained operable under all design basis conditions. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of current performance because it was associated with a modification that occurred in the 1980s. (Section 1R15)

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a finding of very low safety significance (Green) with an associated non-cited violation of 10 CFR 50.54(q)(2) as required by 10 CFR 50.47(b)(10) and 10 CFR Part 50, Appendix E, Section IV.4, for failing to maintain the effectiveness of

the Quad Cities Nuclear Power Station Emergency Plan, as a result of failing to provide the station evacuation time estimate (ETE) to the responsible offsite response organizations by the required date.

Exelon submitted the Quad Cities Nuclear Power Station ETE to the NRC on December 12, 2012, prior to the required due date of December 22, 2012. The NRC completeness review found the ETEs to be incomplete due to Exelon fleet common and site-specific deficiencies, thereby preventing Exelon from providing the ETEs to responsible offsite response organizations and from updating site-specific protective action strategies as necessary. The NRC discussed its concerns regarding the completeness of the ETE, in a teleconference with Exelon on June 10, 2013, and on September 5, 2013, Exelon resubmitted the ETEs for its sites. The NRC again found the ETEs to be incomplete. The issue is a performance deficiency because it involves a failure to comply with a regulation that was under Exelon's control to identify and prevent. The finding is more than minor because it is associated with the Emergency Preparedness Cornerstone attribute of procedure quality and because it adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The finding is of very low safety significance (Green) because it was a failure to comply with a non-risk significant portion of 10 CFR 50.47(b)(10). The licensee had entered this issue into their corrective action program (CAP) and re-submitted a new revision of the Quad Cities Nuclear Power Station ETE to the NRC on April 30, 2014. The cause of the finding is related to cross-cutting element of Human Performance, Documentation [H.7]. (Section 1EP5)

Licensee-Identified Violations

Violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. The violation and CAP tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1

Unit 1 operated at 100 percent thermal power with the exception of planned power reductions for routine surveillances, main condenser flow reversals, planned equipment repair, and control rod maneuvers from July 1, 2014 through September 30, 2014.

Unit 2

Unit 2 operated at 100 percent thermal power with the exception of planned power reductions for routine surveillances, main condenser flow reversals, planned equipment repair, and control rod maneuvers from July 1, 2014 through September 30, 2014.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. 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 a probable maximum precipitation event 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 for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding sample as defined in Inspection Procedure (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 1 high pressure coolant injection (HPCI) during Unit 1 reactor core isolation cooling (RCIC) surveillance window;
- Unit 2 RCIC during Unit 2 HPCI surveillance window;
- Unit 1 “B” residual heat removal service water (RHRSW) during Unit 1 “A” RHRSW maintenance; and
- Unit 1/2 “A” and “B” standby gas treatment system during secondary containment maintenance.

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 corrective action program (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.

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 1.1.2.2, Unit 2 reactor building, elevation 595'-0", ground floor;

- Fire zone 6.3, services building, elevation 595'-0", auxiliary electric room;
- Fire zone 1.1.1.3, Unit 1 reactor building, elevation 623'-0", mezzanine level;
- Fire zone 1.1.2.3, Unit 2 reactor building, elevation 623'-0", mezzanine level; and
- Fire zone 8.2.8.E, Units 1 and 2 turbine building, elevation 639'-0", main turbine floor (outside shield wall).

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan.

The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the CAP to verify the adequacy of the corrective

actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- Manhole numbers 1 and 2

Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one underground vaults 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 the licensee's testing of Unit 2 RHRSW pump area cooler/heat exchangers 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 testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. 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.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On August 19, 2014, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification 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 of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On September 10-11, 2014, the inspectors observed the tie in and separation activities of the Unit 2 125 Vdc alternate battery and the Unit 2 turbine building reserve bus 2B-1 associated with the Unit 2 125 Vdc system modification. This was an activity that required heightened awareness 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.

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:

- Units 1 and 2 24/48 voltage direct current (Vdc) system;
- 10 CFR 50.65 (a)(3) periodic evaluation for the assessment period May 1, 2012-May 1, 2014; and
- Units 1 and 2 area radiation monitors.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for 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 14-27-03: Unit 2 online risk evaluation, Unit 2 digital electrohydraulic control card replacement;
- Work week 14-29-05: Unit 1 RCIC and core spray maintenance;
- Work week 14-36-12: Unit 2 station blackout maintenance/Unit 1 hydraulic control unit rebuild/secondary containment core bore; and
- Work week 14-37-13: 125 Vdc modification and cable replacement.

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 four samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 2 HPCI steam drain pot;
- Unit 1 "A" RHRSW check valve as-found condition and discharge elbow flaw evaluation;
- IR 1700084: 912-1 G-12, control room standby heating, ventilation and air conditioning system major trouble alarm; and
- IR 1672301: NRC ID'D angle iron support against the Unit 2 torus.

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 four samples as defined in IP 71111.15–05.

b. Findings

(1) Angle Iron Support Installed with Minimal Clearance to Unit 2 Torus Shell

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” was identified by the inspectors for the licensee’s failure to evaluate the impact of a conduit support installed in close proximity of the Unit 2 torus shell. Specifically, during installation of the conduit support, the licensee failed to provide instructions to ensure that sufficient clearance from the torus shell was provided to accommodate the torus wall movements predicted in the UFSAR torus design basis load cases.

Description: On June 17, 2014, during a plant walkdown, the inspectors identified that a steel angle member supporting a conduit was installed in apparent contact with the Unit 2 torus shell. The licensee documented the condition in IR 1672301. The licensee did not have an evaluation for the installed condition, and initiated Operation Evaluation 1672301-02. The licensee determined that the conduit in question had been field routed during modification 04-2-80-12 (for a nonsafety-related sample system) installation in the late 1980s. The licensee also performed an extent of condition walkdown on both Units and identified six additional pieces of equipment that were within 1 inch of the Unit 1 torus shell. The inspectors subsequently identified one additional support that was not identified by the licensee and one support that was identified by the licensee but not documented in their evaluation (both supports were on Unit 1). The licensee’s operability evaluation determined that thermal loading design basis cases were the most limiting cases for torus movement. The operability determination concluded that for the most limiting conditions, the torus shell would deform, but not puncture or tear, and maintain operability. The inspectors reviewed the operability determination and did not identify any additional concerns.

Analysis: The inspectors determined that the conduit installation near the torus without sufficient clearance from the torus wall was contrary to the UFSAR design basis of the torus and was a performance deficiency. Specifically, the physical interaction between the conduit support and the torus could result in an unanalyzed condition; the potential impact load during seismic or design basis events was not considered in the modification that installed the conduit.

The performance deficiency was determined to be more than minor because the finding was associated with the design control attribute of both the Mitigating Systems and Barrier Integrity Cornerstones. The finding adversely affected the Mitigating Systems Cornerstone attribute of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding also adversely affected the Barrier Integrity Cornerstone objective of providing reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events.

In accordance with IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," Table 2, the inspectors determined the finding affected the Mitigation Systems and Barrier Integrity Cornerstones. As a result, the inspectors determined the finding could be evaluated using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibits 2 and 3 for the Mitigating Systems and Barrier Integrity Cornerstones, respectively, because the finding affected performance of emergency core cooling systems, the suppression pool, and primary containment. The inspectors determined the finding screened as very low safety significance (Green) in both Exhibit 2 and 3 because the licensee's operability evaluation determined the torus remained operable under all design basis conditions.

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of current performance because it was associated with a modification that occurred in the 1980s.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to ensure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The UFSAR torus design basis analyses, such as Suppression Chamber Static Analyses Calculation Package 64.305.2011, dated 1982, determined the potential torus displacements resulting from operating and design basis events.

Contrary to the above, during the conduit installation for modification 04-2-80-12 in the 1980's, the licensee failed to ensure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, during installation of the conduit support the licensee failed to provide instructions to ensure that sufficient clearance from the torus shell was provided to accommodate the torus wall movements predicted in the UFSAR torus design basis load cases.

Immediate corrective actions included performing an operability evaluation that determined the torus remained operable under all design basis events. The licensee corrected the condition by cutting the conduit support to ensure sufficient clearance to the torus wall would be maintained. Because this violation was of very low safety significance and was entered into the licensee's CAP as IR 1672301, the violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000254/2014004-01, 05000265/2014004-01, Angle Iron Support Installed with Minimal Clearance to Unit 2 Torus Shell)**

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification(s):

- Engineering Change 398698: Unit 1 cable replacement for main feed from Unit 2 battery (1A bus to 2B bus)

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

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- Unit 1/2 “B” standby gas treatment valve timing test and valve position indication following maintenance on motor control center 19-4 D4 breaker;
- Unit 1/2 “B” diesel fire pump capacity test following planned maintenance;
- Unit 2 125 Vdc battery charger #2 4-hour load test;
- Unit 1 emergency diesel generator load test after replacement of speed switch; and
- WO 1751942: Unit 1 hydraulic control Unit (HCU) 14-51, 127 diaphragm is split and leaking.

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 post-maintenance testing samples as defined in IP 71111.19–05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following 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:

- QCOS 1300-06: RCIC system high-medium risk motor operated valve test (IST);
- QCEMS 0230-12: Unit 1(2) 125 Vdc SBO [station blackout] battery performance test;
- QCIS 2300-04: HPCI steam line high flow analog trip system calibration and functional test;
- Surveillance test interval change for QCOS 0500-12, RPS test switch functional test, from weekly to monthly;
- QCOS 0010-17: portable diesel pump surveillance; and
- QCOS 6600-51: Unit 1 emergency diesel generator start failure logic test.

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 five routine surveillance testing samples and one in-service testing sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

1EP4 Emergency Action and Emergency Plan Changes (71114.04)

.1 Emergency Action and Emergency Plan Changes

a. Inspection Scope

The Nuclear Security and Incident Response headquarters staff performed an in-office review of the latest revision to the ETE analysis for Quad Cities Nuclear Power Station, Units 1 and 2 (ADAMS Accession Number ML14128A158) and was part of the corrective actions to the NCV 05000254/265/2014004-02 listed in Section 1EP5 below.

The staff performed a review using the guidance provided in NUREG/CR-7002, “Criteria for Development of Evacuation Time Estimate Studies.” The Updated evacuation time estimate was found to be complete in accordance with 10 CFR Part 50, Appendix E.IV.3. The NRC review was only intended to verify consistent application of the ETE guidance contained in NUREG/CR-7002; and therefore remains subject to future NRC inspection in its entirety. The specific document reviewed during this inspection is listed in the Attachment to this report.

This emergency plan review did not constitute an inspection sample as defined in IP 71114.04-06

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness (71114.05)

.1 Maintaining Emergency Preparedness

a. Inspection Scope

Nuclear Regulatory Commission emergency preparedness (EP) rulemaking, which became effective on December 23, 2011, added a new regulation that required a licensee to develop an ETE analysis and submit to the NRC by December 22, 2012. This inspection was a follow-up of issues identified by the NRC headquarters staff during its review of the Exelon submittal of the ETE for the ten sites that it operates. The NRC headquarters staff related those issues to Exelon, which provided responses through 2013 and into 2014. During this inspection period, regional EP inspectors reviewed applicable licensee documents, conducted discussions with licensee personnel and provided assessment of the Exelon response.

This emergency preparedness inspection constituted no samples as defined in IP 71114.05-06.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) with an associated NCV of 10 CFR 50.54(q)(2) for failing to maintain the effectiveness of the Quad Cities Nuclear Power Station Emergency Plan. Specifically, the licensee failed to provide the station ETE to responsible offsite response organizations (OROs) and failed to update their site-specific protective action strategies as necessary as required by 10 CFR 50.47(b)(10), and Section IV, Paragraph 4 of Appendix E to 10 CFR Part 50.

Description: The NRC issued final new and amended EP regulations on November 23, 2011 (76 Federal Register 72560). This rulemaking, which became effective on December 23, 2011, amended 10 CFR 50.47(b)(10) to require licensees to update the ETE on a periodic basis. The rulemaking also added a new regulation 10 CFR Part 50, Appendix E, Section IV.4, which requires a licensee to develop an ETE analysis using the most recent decennial census data and submit it to the NRC within 365 days of December 23, 2011. Concurrently with the issuance of the rulemaking, the NRC published a new report entitled "Criteria for Development of Evacuation Time Estimate Studies," NUREG/CR-7002. The Statements of Consideration for the rulemaking (76 Federal Register 72580) identified that the NRC would review the submitted ETEs for completeness using NUREG/CR-7002. The Statements also provided that NUREG/CR-7002 guidance was an acceptable template to meet the requirements and that licensees should use the guidance or an appropriate alternative.

By individual letters dated December 12, 2012, Exelon submitted the ETEs for the sites for which it holds the operating licenses, including Quad Cities Nuclear Power Station. By a letter dated January 23, 2013, Exelon submitted the NUREG/CR-7002 checklists for these ETEs. These checklists identified where a particular criterion was addressed in the ETEs, facilitating the NRC review.

As provided in the Statements of Consideration, the NRC performed a completeness review using the checklists and found the ETEs (including that for the Quad Cities Nuclear Power Station) to be incomplete due to common and site-specific deficiencies. The NRC discussed its concerns regarding the completeness of the ETEs in a teleconference with Exelon conducted on June 10, 2013. By letter dated September 5, 2013, Exelon resubmitted the ETEs and the associated checklists for its sites. The NRC performed another completeness review and again found the ETEs to be incomplete. Examples of information missing from the submittal included: 1) peak and average attendance were not stated (NUREG/CR-7002 Criteria Item 2.1.2.a); 2) the ETE used a value based on campsite and hotel capacity, vice an average value (2.1.2.b); 3) basis for speed and capacity reduction factors due to weather was not provided (3.4.b); 4) snow removal was not addressed (3.4.c); 5) no bus routes or plans were included in the ETE analysis (4.1.2.a); and, 6) no discussion on the means of evacuating ambulatory and non-ambulatory residents was included (4.1.2.b).

Exelon entered this issue into their CAP as IR 1525923 and IR 1578649. Exelon submitted a third ETE for Quad Cities Nuclear Power Station on April 30, 2014, and the NRC's review of that ETE was found complete and is documented in Section 1EP4 of this report.

Analysis: The inspectors determined that Exelon's failure to submit a complete updated ETE for the Quad Cities Nuclear Power Station by December 22, 2012, was a licensee performance deficiency because the issue was a failure to comply with a regulatory requirement and the issue was reasonably within the licensee's ability to foresee and correct, and therefore should have been prevented for both the December 12, 2012, and September 5, 2013, submittals.

Using IMC 0612, Appendix B, "Issue Screening," the inspectors determined that the performance deficiency is associated with the Emergency Preparedness Cornerstone attribute of procedure quality and was more than minor because it adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The ETE is an input into the development of protective action strategies prior to an accident and to the protective action recommendation decision making process during an accident. Inadequate ETEs have the potential to reduce the effectiveness of public protective actions implemented by the OROs.

The inspectors utilized IMC 0609, Appendix B, "Emergency Preparedness (EP) Significance Determination Process (SDP)," to determine the significance of the performance deficiency. The performance deficiency was associated with planning standard 10 CFR 50.47(b)(10). Emergency Preparedness SDP Table 5.10-1, "Significance Examples §50.47(b)(10)," provides two Green significance examples: "ETEs and updates to the ETEs were not provided to responsible OROs," and "The current public protective action strategies documented in emergency preparedness implementing procedures (EPIPs) are not consistent with the current ETE." The

inspector concluded that, because the performance deficiency delayed the NRC's approval of the Quad Cities Nuclear Power Station ETE, the ETE was not provided to the site OROs nor was it used to inform the site emergency preparedness implementing procedures as required by 10 CFR 50.47(b)(10), and Section IV, Paragraph 4 of Appendix E to 10 CFR Part 50. Therefore, In accordance with EP SDP Table 5.10-1, this finding screened as Green.

This finding had a cross-cutting aspect in the area of human performance, documentation, because Exelon personnel did not create and maintain complete, accurate and, up-to-date documentation. Specifically, the EP organization did not develop the Quad Cities Nuclear Power Station ETE as required by the new regulation introduced by the NRC's EP Rule [H.7].

Enforcement: 10 CFR 50.54(q)(2) states, in part, that a licensee shall follow and maintain the effectiveness of an emergency plans which meets the requirements in Appendix E to this part and the planning standards of 10 CFR 50.47(b). 10 CFR 50.47(b)(10), requires, in part, that licensees shall develop an evacuation time estimate and update it on a periodic basis. 10 CFR Part 50 Appendix E, Section IV.4, states that within 365 days of December 23, 2011, nuclear power reactor licensees shall develop an ETE analysis and submit it under 10 CFR 50.4.

Contrary to the above, the licensee failed to develop a complete and adequate ETE analysis and submit it under 10 CFR 50.4 within 365 days of December 23, 2011. Immediate corrective actions taken by Exelon included entering this issue into their CAP and revising the ETE to satisfy NRC requirements. Because this finding is of very low safety significance (Green) and was entered into the licensee's CAP, this issue is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000254/2014004-02; 05000265/2014004-02, Inadequate Evacuation Time Estimate Submittals)**

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on September 17, 2014, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the 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 drill critique to compare any inspector-observed weakness 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.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

2RS5 Radiation Monitoring Instrumentation (71124.05)

This inspection constituted a complete sample as defined in IP 71124.05-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the plant UFSAR to identify radiation instruments associated with monitoring area radiological conditions including airborne radioactivity, process streams, effluents, materials/articles, and workers. Additionally, the inspectors reviewed the instrumentation and the associated TS requirements for post-accident monitoring instrumentation, including instruments used for remote emergency assessment.

The inspectors reviewed a listing of in-service survey instrumentation including air samplers and small article monitors, along with instruments used to detect and analyze workers' external contamination. Additionally, the inspectors reviewed personnel contamination monitors and portal monitors, including whole body counters, to detect workers' internal contamination. The inspectors reviewed this list to assess whether an adequate number and type of instruments were available to support operations.

The inspectors reviewed licensee and third-party evaluation reports of the radiation monitoring program since the last inspection. These reports were reviewed for insights into the licensee's program and to aid in selecting areas for review ("smart sampling").

The inspectors reviewed procedures that govern instrument source checks and calibrations, focusing on instruments used for monitoring transient high radiological conditions, including instruments used for underwater surveys. The inspectors reviewed the calibration and source check procedures for adequacy and as an aid to smart sampling.

The inspectors reviewed the area radiation monitor alarm setpoint values and setpoint bases as provided in the TS and the UFSAR.

The inspectors reviewed effluent monitor alarm setpoint bases and the calculational methods provided in the offsite dose calculation manual (ODCM).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down effluent radiation monitoring systems, including at least one liquid and one airborne system. Focus was placed on flow measurement devices and all

accessible point-of-discharge liquid and gaseous effluent monitors of the selected systems. The inspectors assessed whether the effluent/process monitor configurations aligned with ODCM descriptions and observed monitors for degradation and out-of-service tags.

The inspectors selected portable survey instruments that were in use or available for issuance and assessed calibration and source check stickers for currency as well as instrument material condition and operability.

The inspectors observed licensee staff performance as the staff demonstrated source checks for various types of portable survey instruments. The inspectors assessed whether high-range instruments were source checked on all appropriate scales.

The inspectors walked down area radiation monitors and continuous air monitors to determine whether they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. Selectively, the inspectors compared monitor response (via local or remote control room indications) with actual area conditions for consistency.

The inspectors selected personnel contamination monitors, portal monitors, and small article monitors and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and the licensee's procedures.

b. Findings

No findings were identified.

.3 Calibration and Testing Program (02.03)

Process and Effluent Monitors

a. Inspection Scope

The inspectors selected effluent monitor instruments (such as gaseous and liquid) and evaluated whether channel calibration and functional tests were performed consistent with radiological effluent TS/ODCM. The inspectors assessed whether; (a) the licensee calibrated its monitors with National Institute of Standards and Technology traceable sources; (b) the primary calibrations adequately represented the plant nuclide mix; (c) when secondary calibration sources were used, the sources were verified by the primary calibration; and (d) the licensee's channel calibrations encompassed the instrument's alarm setpoints.

The inspectors assessed whether the effluent monitor alarm set points were established as provided in the ODCM and station procedures.

For changes to effluent monitor set points, the inspectors evaluated the basis for changes to ensure that an adequate justification existed.

b. Findings

No findings were identified.

.4 Laboratory Instrumentation

a. Inspection Scope

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicated that the frequency of the calibrations was adequate and there were no indications of degraded instrument performance.

The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded instrument performance.

b. Findings

No findings were identified.

.5 Whole Body Counter

a. Inspection Scope

The inspectors reviewed the methods and sources used to perform whole body count functional checks before daily use of the instrument and assessed whether check sources were appropriate and aligned with the plant's isotopic mix.

The inspectors reviewed whole body count calibration records since the last inspection and evaluated whether calibration sources were representative of the plant source term and that appropriate calibration phantoms were used. The inspectors looked for anomalous results or other indications of instrument performance problems.

b. Findings

No findings were identified.

.6 Post-Accident Monitoring Instrumentation

a. Inspection Scope

The inspectors selected containment high-range monitors and reviewed the calibration documentation since the last inspection.

The inspectors assessed whether an electronic calibration was completed for all range decades above 10 rem/hour and whether at least 1 decade at or below 10 rem/hour was calibrated using an appropriate radiation source.

The inspectors assessed whether calibration acceptance criteria were reasonable; accounting for the large measuring range and the intended purpose of the instruments.

The inspectors selected effluent/process monitors that were relied on by the licensee in its emergency operating procedures as a basis for triggering emergency action levels and subsequent emergency classifications, or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments.

The inspectors reviewed the licensee's capability to collect high-range, post-accident iodine effluent samples.

As available, the inspectors observed electronic and radiation calibration of these instruments to assess conformity with the licensee's calibration and test protocols.

b. Findings

No findings were identified.

.7 Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors

a. Inspection Scope

For each type of these instruments used on site, the inspectors assessed whether the alarm set point values were reasonable under the circumstances to ensure that licensed material is not released from the site.

The inspectors reviewed the calibration documentation for each instrument selected and discussed the calibration methods with the licensee to determine consistency with the manufacturer's recommendations.

b. Findings

No findings were identified.

.8 Portable Survey Instruments, Area Radiation Monitors, Electronic Dosimetry, and Air Samplers/Continuous Air Monitors

a. Inspection Scope

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and had the licensee demonstrate use of its instrument calibrator as applicable. The inspectors conducted comparison of instrument readings versus an NRC survey instrument if problems were suspected.

As available, the inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks to assess whether the licensee had taken appropriate corrective action for instruments found significantly out of calibration (e.g., greater than 50 percent). The inspectors evaluated whether the licensee evaluated the possible consequences of instrument use since the last successful calibration or source check.

b. Findings

No findings were identified.

.9 Instrument Calibrator

a. Inspection Scope

As applicable, the inspectors reviewed the current output values for the licensee's portable survey and area radiation monitor instrument calibrator Unit(s). The inspectors assessed whether the licensee periodically measures calibrator output over the range of the instruments used through measurements by ion chamber/electrometer.

The inspectors assessed whether the measuring devices had been calibrated by a facility using National Institute of Standards and Technology traceable sources and whether corrective factors for these measuring devices were properly applied by the licensee in its output verification.

b. Findings

No findings were identified.

.10 Calibration and Check Sources

a. Inspection Scope

The inspectors reviewed the licensee's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

b. Findings

No findings were identified.

.11 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation.

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 Physical Protection

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - high pressure injection systems performance indicator (PI) for Units 1 and 2 for the period from the October 1, 2013 - June 30, 2014. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC integrated inspection reports for the period of October 1, 2013 - June 30, 2014 to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's 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 MSPI high pressure injection system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As 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 Selected Issue Follow-up Inspection: IR 1660714 – 2C Condenser Backpressure Response is Slow

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting the slow response of 2C main condenser vacuum indication during a Unit 2 main condenser flow reversal on May 16, 2014. As a result of this response, pressure switch 2-0503-B was declared inoperable. This pressure switch provides input for the turbine condenser vacuum-low function of the reactor protection system (RPS) as one of the four required channels. Technical Specification 3.3.1.1 was entered at 4:45 a.m. on May 16, 2014, requiring the licensee to place the channel or associated RPS trip system in trip within 12 hours.

The licensee's investigation determined that the "C" condenser pressure indicator root valve (2-3199-75C) was mostly closed, therefore, isolating the RPS pressure switch. The valve was found to have missing one of the gland follower bolts and corresponding fastener. These discrepancies were corrected and the valve was fully opened. Pressure switch 2-0503-B was declared operable and TS 3.3.1.1 was exited at 12:23 p.m. on May 16, 2014.

Further licensee investigation determined that the valve had inadvertently closed on May 6, 2014, at approximately 6:20 p.m. At that time, Unit 2 was in MODE 2. Unit 2 returned to power after a refueling outage and entered MODE 1 at 10:52 p.m. on May 6, 2014. The licensee investigation also identified that the "C" condenser pressure indicator root valve (2-3199-75C) was also found to have been partially closed on April 14, 2010, after outage activities in the area of the valve.

The inspectors reviewed Equipment Apparent Cause Evaluation 1660714-06, "2C Condenser Backpressure Response is Slow," associated with the May 16, 2014, event and Apparent Cause Evaluation 1056375-06, "Technical Specification Required Instrument Inoperable Prior to Entry into Mode 1 and Existed for >12 Hours While in MODE 1," associated with the April 14, 2010 event. The inspectors assessed whether the licensee's determination of the apparent and contributing causes, corrective actions, and effectiveness measures were appropriate. Section 4OA7 below describes a licensee-identified violation associated with this event.

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

b. Findings

No findings were identified.

.4 Selected Issue Follow-Up Inspection: Emergency Diesel Generator Start Failure Relay Preventative Maintenance Replacement Frequency [Operating Experience Smart Sample (OpESS) FY 2010-01 "Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life"]

- a. During a review of items entered into the licensee's CAP, the inspectors reviewed IR 01611255, "U2 EDG Start Failure Relay Failure during Surveillance." The inspectors noted that the licensee replaced and retested the failed relay prior to declaring the emergency diesel generator (EDG) operable. The inspectors reviewed operating experience and generic communications related to aging management. The inspectors also reviewed the licensee's apparent cause evaluation performed under IR 01611255. The licensee's investigation revealed that there were no preventative maintenance replacement requirements for the start failure relay 2-6601-SF. The evaluation also determined that the relays were classified in accordance with procedure ER-AA-200, "Preventative Maintenance Program." Failure analysis for the relay determined that the relay failed due to "aging of the component." The licensee determined that a one-time replacement of the relays, including the common Unit EDG and the Unit 1 EDG, was appropriate corrective action. The inspectors questioned whether the relays were classified appropriately and whether the licensee was classifying the relays as run-to-failure. The inspectors requested the licensee to provide design life information from the manufacturer contained in the vendor manual, purchase specification, or certificate of compliance. The licensee was not able to locate any documented design life for the relays in question and stated that discussions with the current vendor that services the EDGs was also not able to find specific information related to these relays. The licensee ultimately determined that a 20-year replacement life-cycle for these relays was appropriate (documented in IR 1674596). Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 Unit 2 “B”/”C” RHRSW Vault Access Restricted Due to Lower Explosive Limit Concentration Exceeding the Limit

a. Inspection Scope

The inspectors reviewed the plant’s response to a report from radiation protection technicians that monthly air sampling results in the 2 “B”/”C” RHRSW vault indicated lower explosive limit concentrations were 13 percent when corrected for hydrogen gas. Radiation protection technicians restricted access to the vault in accordance with their procedure SA-QC-114-1106, “Quad Cities RHR Service Water Vault Confined Space Air Monitoring.” The inspectors reviewed the licensee emergency action levels associated with hazards and other conditions affecting plant safety. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report 05000265/2014-003-00: RPS Pressure Switch for Condenser Vacuum – Low Inoperable and Exceeded Technical Specifications

a. Inspection Scope

This event, which occurred on May 6, 2014, involved the reactor protection system pressure switch 2-0503-B which was found inoperable during a Unit 2 main condenser flow reversal on May 16, 2014. See Section 4OA2.3 for a detailed description of the event. A licensee-identified violation associated with this event and the enforcement aspects are discussed in Section 4OA7 below. Documents reviewed are listed in the Attachment to this report. This licensee event report is closed.

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

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Attachment 2 for Quad Cities Nuclear Power Station, NRC Inspection Report 05000254/2014003; 05000265/2014003

Discussion

Quad Cities Nuclear Power Station, NRC Inspection Report 05000254/2014003; 05000265/2014003, Section 4OA5.1, documents the completion of an inspection and review of the Quad Cities snubber program in accordance with Temporary Instruction (TI) 2515/189 to verify that the program was in compliance with the requirements of Title 10 of the Code of Federal Regulations 50.55a, as discussed in Regulatory Information Summary 2010-06, “In-service Inspection and Testing of Dynamic Restraints

(Snubbers).” That report references an Attachment 2, which documents the licensee’s responses to specific questions found in Attachment 1 of TI 2515/189. Attachment 2 was not included in NRC Inspection Report 05000254/2014003; 05000265/2014003 and is therefore included as Attachment 2 of this inspection report.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 7, 2014, 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:

- The results of the area of radiation monitoring instrumentation inspection with Mr. S. Darin, Site Vice President, on August 8, 2014.
- The results of the EP Program inspections with Mr. S. Merrell, Emergency Preparedness Director, conducted by phone on September 8, 2014.

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

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) or Severity Level IV was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

The licensee identified a violation of TS 3.3.1.1, “RPS Instrumentation,” and TS LCO 3.0.4. Technical Specification 3.3.1.1 specifies that four channels of turbine condenser vacuum-low scram function are required to be operable in MODE 1. Technical Specification 3.3.1.1, Condition A, stated that if one channel is not operable, the channel of the associated trip system is to be placed in trip within 12 hours. Technical Specification 3.0.4 specifies the requirements that must be satisfied prior to making a MODE change if a limiting condition for operation (LCO) is not met. Limiting Condition for Operations 3.0.4 stated, in part, that when an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition for an unlimited period of time.

Contrary to the above, from May 6, 2014 to May 16, 2014, the licensee failed to meet the provisions of TS 3.3.1.1 and LCO 3.0.4. Specifically, on May 16, 2014, RPS pressure switch 2-0503-B was declared inoperable. The licensee determined that the cause was the inadvertent closure of the “C” condenser pressure indicator root valve on May 6, 2014, at approximately 6:20 p.m. while Unit 2 was in MODE 2. Unit 2 entered MODE 1 at 10:52 p.m. on May 6, 2014. Therefore, the licensee transitioned to MODE 1 without the required number of channels and did not take the required action to place the

channel or associated trip system in the trip condition within 12 hours. Section 4OA2.5 above provides additional background description for this licensee-identified violation. The licensee documented the conditions prohibited by TSs for pressure switch 2-0503-B in IR 1660714. Because the inspectors answered “No” to all questions in Section C of IMC 0609 Appendix A, “The Significance Determination Process for Findings At Power,” Exhibit 2 – Mitigating Systems Screening Questions, the finding screened as very low safety significance (Green).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Darin, Site Vice President
K. O'Shea, Plant Manager
C. Alguire, Senior Engineering Manager
D. Collins, Radiation Protection Manager
H. Dodd, Maintenance Director
J. Friedrichsen, NOS Lead Assessor
D. Kimler, Operations Director
T. Petersen, Regulatory Assurance Lead
T. Scott, Work Management Director
J. Wooldridge, Chemistry Manager

Nuclear Regulatory Commission

C. Lipa, Chief, Reactor Projects Branch 1

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000254/2014004-01; 05000265/2014004-01	NCV	Angle Iron Support Installed with Minimal Clearance to Unit 2 Torus Shell (Section 1R15)
05000254/2014004-02; 05000265/2014004-02	NCV	Inadequate Evacuation Time Estimate Submittals (Section 1EP5)

Closed

05000254/2014004-01; 05000265/2014004-01	NCV	Angle Iron Support Installed with Minimal Clearance to Unit 2 Torus Shell (Section 1R15)
05000254/2014004-02; 05000265/2014004-02	NCV	Inadequate Evacuation Time Estimate Submittals (Section 1EP5)
05000265/2014-003-00	LER	RPS Pressure Switch for Condenser Vacuum – Low Inoperable and Exceeded Technical Specifications (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.

Section 1R01

- QCOA 0010-16: Flood Emergency Procedure; Revision 21
- QCOP 4400-04: Traversing Trash Rake; Revision 25
- QCOA 0010-12: Local Intense Precipitation Response Procedure; Revision 1
- IR 1677798: B.5.b Ramp Partially under Water; July 1, 2014
- IR 1679839: NRC: River Level Gauge Availability; July 8, 2014

Section 1R04

- QOM 1-1001-05: U1 RHR Service Water Valve Checklist; Revision 22
- QCOP 1300-01: RCIC System Preparation for Standby Operation; Revision 43
- QOM 2-1300-02: Unit 2 RCIC Valve Checklist; Revision 11
- QCOS 1300-11: RCIC Valve Position Verification
- Drawing M-89, Sheet 1: Diagram of Reactor Core Isolation Cooling; Revision BE
- QCOP 2300-15: Unit 1 HPCI Preparation for Standby Operation; Revision 4
- QOM 1-2300-01: U1 HPCI Valve Checklist; Revision 13
- QOM 1-2300-02: HPCI System Fuse and Breaker Checklist; Revision 6
- IR 01682075: NRC Identified: Grease Leak from MO 1-2301-3; July 15, 2014
- QCOP 7500-01: Standby Gas Treatment System Standby Operation and Startup; Revision 20

Section 1R05

- Fire Zone 6.3: Quad Cities Generating Station Pre-Fire Plan, SB 595'-0" Elevation, Auxiliary Electric Room
- Quad Cities 1 & 2 Fire Analysis (FZ 6.3); Revision 21
- Fire Zone 1.1.2.2: Quad Cities Generating Station Pre-Fire Plan, Unit 2 RB 595'-0" Elevation, Ground Floor
- Fire Zone 1.1.1.3: Quad Cities Generating Station Pre-Fire Plan, Unit 1 RB 623'-0" Elevation, Mezzanine Level
- Fire Zone 1.1.2.3: Quad Cities Generating Station Pre-Fire Plan, Unit 2 RB 623'-0" Elevation, Mezzanine Level
- Fire Zone 8.2.8.E: Quad Cities Generating Station Pre-Fire Plan, Unit 1 TB 639'-0" Elevation, Main Turbine Floor (Outside Shield Wall)
- Fire Zone 8.2.8.E: Quad Cities Generating Station Pre-Fire Plan, Unit 2 TB 639'-0" Elevation, Main Turbine Floor (Outside Shield Wall)
- IR 1604972: Bearing 1 Fire Bell Not Ringing Continuously; January 7, 2014
- IR 1695101: NRC ID'D: Compensatory Fire Hose Missing FME Barrier; April 21, 2014

Section 1R06

- IR 1741233: Unable to Remove Contaminated Water from Manhole; September 5, 2014
- WO 1744551: Quarterly Cable Vault Water Intrusion Inspection

Section 1R07

- ER-AA-340-1002: Service Water Heat Exchanger Inspection Guide; Revision 6
- QCTP 0820-10: Heat Exchanger and Room Cooler Inspection; Revision 6
- WO 1227282: 2C RHRSW Pmp Area Clr Cln/Insp; February 9, 2011
- WO 1349731: 2B RHRSW Pmp Area Clr Cln/Insp; April 4, 2011
- WO 1526941: 2A RHRSW Pmp Area Clr Cln/Insp; July 17, 2013
- WO 1555290: 2D RHRSW Pmp Area Clr Cln/Insp; February 3, 2014
- EC 384132: Acceptable Min Wall Thickness for DGCW Room Cooler Header Line; Revision 0
- ECR 406537: RHRSW Cubicle Cooler Min Wall Information Applicability of EC 384132; September 12, 2012
- IR 2384954: U2 RHRSW Pump Cross Over Piping Lagging is Damaged; September 23, 2014
- IR 2385215: Vent/Drain Line Plugged Downstream of 2-1001-193C/194C Vlvs; September 23, 2014
- IR 2385638: NOS ID: Potential LCO Delay Due to Incorrect Documentation; September 24, 2014
- IR 2386649: 2D RHRSW Room Cooler Header UT Readings Below Min Wall; September 26, 2014
- IR 2386763: 2C RHRSW Room Cooler Header UT Readings Below Min Wall; September 26, 2014
- IR 2386925: 2C RHRSW Room Cooler RO and FE UT Measurements; September 26, 2014

Section 1R11

- Quad Cities License Operator Requal Training Module EOP-1; Revision 1, July 2014
- TIC 3254: Transfer of Unit Two 125 Vdc Bus 2B-1 and 2B-2 Between Normal and Alternate Battery; Revision 1a
- Drawing 4E-1318B: 125 Vdc Distribution Centers; Revision J

Section 1R12

- ER-AA-310: Implementation of the Maintenance Rule; Revision 9
- ER-AA-310-1005: Maintenance Rule – Dispositioning Between (a)(1) and (a)(2); Revision 11
- Maintenance Rule Database for:
 - AR1800: Area Rad Monitoring
 - DC8325: 24/48 Vdc System
- QGA 300: Secondary Containment Control; Revision 12
- IR 1398675: U2 HPCI ARM Giving Spurious Downscale Alarms; August 8, 2012
- IR 1425505: Spurious Alarms from U2 ARM 11 (HPCI Area); October 12, 2012
- IR 1455366: Received 902-3 E1, Area Monitor Downscale Alarm for RCIC #12; December 23, 2012
- IR 1480464: U2 RCIC Area ARM #12 Failed; February 26, 2013
- IR 1496023: Spurious Alarms from U2 ARM 11 (HPCI Room); April 1, 2013
- IR 1498691: Received 902-3 E1 Area Monitor Downscale Alarm for RCIC #12; April 7, 2013
- IR 1501551: Received 902-3 A-1 Rx Bldg Hi Radiation for ARM 10 Torus; April 13, 2013
- IR 1504720: ARM 11 (U2 HPCI Room) Failed High; April 21, 2013
- IR 1509082: ARM Sensor Converter Multiple Failures; May 1, 2013
- IR 1652362: MRule A1 Evaluation Required; April 27, 2014
- IR 1674003: Rcvd 901-5 G1 Ckt Fail, 1A+ 24/48 Batt Charger; June 22, 2014
- IR 2382073: Potential Eqp Rel Vulnerability for Circuit Board Rplcmnts; September 17, 2014
- IR 1502419: Rcvd 901-5 G1 Ckt Fail, 1A+ 24/48 Batt Charger; April 16, 2013

- IR 1562731: Loss of 2A 24/48 Vdc Battery Charger; September 24, 2013
- IR 1693374: U1 24/48V 1B(-) Charger Failed. 901-5 G-1 Unexpected Alarm; August 17, 2014
- IR 2381087: Expedited Replacement of A1 Controller Card Required; September 15, 2014

Section 1R13

- TIC 3254: Transfer of Unit Two 125 Vdc Bus 2B-1 and 2B-2 Between Normal and Alternate Battery; Revision 1a
- Drawing 4E-1318B: 125 Vdc Distribution Centers; Revision J

Section 1R15

- OP-AA-108-115: Operability Determinations (CM-1); Revision 14
- Drawing M-87, Sheet 1: Diagram of High Pressure Coolant Injection – HPCI Piping; Revision BN
- IR 1689926: HPCI Pump Inboard Seal has 6 dpm Leak; August 6, 2014
- IR 1689928: U2 HPCI Condensate Pump Sounds Abnormally Noisy; August 6, 2014
- IR 1689671: Investigate HPCI Drain Pot Level Switch 2-2365; August 6, 2014
- IR 1689956: OOT, FIS 2-2354, Trend Code B4; August 6, 2014
- IR 1689318: U2 HPCI LS 2-2365, HPCI Steam Supply Drain Pot Sticking; dated August 5, 2014
- IR 1687895: Corrosion Pit Found During Visual Inspection of Pump Disch Elbow; July 31, 2014
- WO 1559291: UT Inspect the 1A RHRSW HP Discharge Elbow; August 4, 2014
- IR 1687840: Broken Spring Bushing and Spring Arms in 1A RHR-SW Pump Disc; July 31, 2014
- Quad Cities UFSAR, Section 9.2; Revision 6
- IR 2383029: ACE Required from SPC for 1A RHRSW HP Elbow Degradation; September 18, 2014
- IR 2383051: RHRSW HP Elbow Extent of Condition Plan; September 18, 2014
- IR 2384605: 1A RHRSW HP Elbow Needs Replaced; September 22, 2014
- OpEval 01672301-02: Operability Evaluation EC 398520; Revisions 0, 1
- QDC-0010-M-0618: Minimum Required Gap Thickness Between Torus Shell and Valve No. MO-1-1402-4B; Revision 1
- Calculation 64.305.2011: Suppression Chamber Static Analysis Calculation Package, Pages 4-32, 7-14/15; Revision 0
- IR 01672301: NRC ID'D Angle Iron Support Against U2 Torus; June 17, 2014
- IR 1675265: IEMA Identified – Potential Torus Interferences; August 24, 2014
- IR 7100084: AR Subj: 912-1 G-12, Control Room Standby HVAC Sys Major Trbl; September 4, 2014

Section 1R18

- IR 16694827: **S Hooks** on Light Fixtures Above Battery Needs Inspected; August 21, 2014
- EC 399148: Review of Seismic Concerns for Lights Above Alternate Batteries
- MA-AA-3001: Removal of In-Service Electrical Panel Covers; Revision 0
- QCEPM 0200-55: Replacement of Breakers in Seismic Qualified 125 Vdc Distribution Panels; Revision 5
- EC 398636: 125 Vdc Distribution Panel Seismic Review for Cover Removal
- QCOP 6900-50 Transfer of Unit Two 125 Vdc Bus 2B-1 and 2B-2 Between Normal and Alternate Battery; Revision 0

- IR 1664739:

- OpEval 1664739: Level III Ground on the Unit 1 125 Vdc Battery System; Revisions 0-2
- QCOS 0005-08: Unit One Electrical Distribution Breaker and Voltage Verification; Revision 31
- IR 1663256: Unit One 125 Vdc Battery Level III Ground; May 20, 2014
- IR 1665621: U1 125 Vdc Ground – Update; May 29, 2014
- EC 398402: Pull New Cables 14183 & 14184 For 125VDC Reserve Bus 2B
- EC 398698: Technical Evaluation to Support Proceduralized TMOD Under QCOP 6900-50
- IR 2059639: Unable to Adjust Voltage on U2 125 Vdc Charger; September 8, 2014

Section 1R19

- QCMMS 4100-33: 1/2-4101B Diesel Driven Fire Pump Annual Capacity Test; Revision 27
- QCMMS 4100-31: Annual Cummins Diesel Fire Pump Engine Inspection; Revision 15
- QCOS 4100-01: Monthly Diesel Fire Pump Test; Revision 30
- WO 1664375: (LR) Diesel Fire Pump B Capacity Test; June 26, 2014
- WO 1760531: 1/2 “B” Fire Diesel Did Not Pass Overcrank Test; August 13, 2014
- WO 1751942: U1 HCU 14-51: 127 Diaphragm Is Split and Leaking; July 9, 2014
- QCGP 4-1: Control Rod Movements and Control Rod Sequence; Revision 44
- WO 1558599: (EQ) MCC 19-4 Cub D4 SBGTS Fan Disch Damper; April 30, 2014
- WO 1753696: “B” SBGT MCC 19-4 D4 Breaker Tripped During PMT; July 10, 2014
- WO 1631445: “B” SBGTS Vlv Position Indication (IST); July 9, 2014
- WO 1736012: Standby Gas Treatment Valve Timing Test – B (IST); July 14, 2014
- IR 1680216: “B” SBGT MCC 19-4 D4 Breaker Tripped During PMT; July 9, 2014
- WO 1767480: Unable to Adjust Voltage on U2 125VDC Charger; September 8, 2014
- WO 1656770: IM Replace U-1 EDG Speed Switch 1-6601-SSP
- QCEPM 0400-10: Emergency Diesel Speed Sensing Circuit Testing and Calibration; Revision 23
- QCOS 6600-41: Unit 1 Emergency Diesel Generator Load Test; Revision 48
- EC 345670: Engineering to Investigate Preconditioning of EDG Support Equipment/ System Relative to Technical Specification Testing Requirements; December 19, 2003

Section 1R22

- WO 1624842: Performance Test of the SBO Batteries; August 20, 2014
- QCEMS 0230-12: Unit 1(2) 125 Vdc SBO Battery Performance Test; Revision 6
- WC-AA-104: Integrated Risk Screening (SBO 125 Vdc Battery Service Test); Revision 20
- QCIS 2300-04: HPCI Steam Line High Flow Analog Trip System Calibration and Functional Test; Revision 18
- WO 1731750: RCIC Valve Timing Test (IST); July 15, 2014
- QCOS 1300-06: RCIC System High-Medium Risk Motor Operated Valve Test; Revision 28
- IR 1681922: AO 1-1301-12 Vlv Timing Missed; July 15, 2014
- ER-AA-425: Implementation of the Technical Specification Surveillance Frequency Control Program; Revision 0
- STI Evaluation QC-14-001: Change Frequency of Performing QCOS 0500-12 from Weekly (7D) to monthly (31D)
- QCOS 0500-12: RPS Test Switch Weekly Functional Test; Revision 17
- QCOS 0010-17: Portable Diesel Pump Surveillance; Revision 0
- QCOP 4100-02: Portable Diesel Pump Operation; Revision 12
- IR 2179314: Off-Site Portable Diesel Pump Surveillance Discrepancies; September 11, 2014
- IR 2382940: Assignments Needed to Update UHS Equipment Requirements; September 18, 2014

- QCOS 6600-51: Unit 1 Emergency Diesel Generator Start Failure Logic Test; Revision 9
- QCEPM 0700-18: Testing and Calibration of Diesel Generator Time Delay Relays; Revision 30
- IR 1611255: U2 EDG Start Failure Relay Failure During Surveillance; January 23, 2014
- IR 1638763: U1 EDG Start Failure Relay Replacement – EOC for U2 EDG SF; March 26, 2014
- IR 1648259: NRC SRI Questions on Start Failure Relay Qualified Life; April 16, 2014

Section 1EP4

- Evacuation Time Estimate Analysis for Quad Cities Nuclear Power Station; April 30, 2014

Section 1EP5

- Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission; "10 CFR 50 Appendix E Evacuation Time Estimate Analysis for Quad Cities Nuclear Power Station"; December 12, 2012 [ML12348A223]
- Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50 Appendix E Evacuation Time Estimate Analysis Checklists"; January 23, 2013 [ML13024A209]
- Letter from J. Barstow (Exelon Generating Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50, Appendix E. Evacuation Time Estimate Analysis Supplemental Response for Braidwood Station, Byron Station, Clinton Power Station, Dresden Nuclear Power Station, LaSalle County Station, Limerick Generating Station, Oyster Creek Nuclear Generating Station, Peach Bottom Atomic Power Station, Quad Cities Nuclear Power Station, and Three Mile Island Nuclear Station"; September 5, 2013 [ML1325A112]

Section 2RS5

- IR 01548924: Count Room Liquid Scintillation Quench Curve Set Should Be Replaced; August 21, 2013
- IR 01559113: Unit 2 Steam Jet Air Ejector High Radiation Alarm; September 16, 2013
- IR 01580048: Area Radiation Monitor Downscale; November 1, 2013
- IR 01586990: 2 Steam Jet Air Ejector Erratic Operation; November 18, 2013
- IR 01592144: 2A Steam Jet Air Ejector Monitor Chassis Spiking; December 3, 2013
- IR 01610200: Intermittent Service Water Radiation Monitor Alarm Unit 1; January 20, 2014
- IR 01629224: Unit 1 1B Fuel Pool Radiation Monitor Spiked High; March 4, 2013
- IR 01641640: Check-in Self-Assessment-Radiation Monitoring Instrumentation; June 2, 2014
- IR 01631169: Abbreviated Maintenance on 1B Fuel Pool Radiation Monitor; March 10, 2014
- IR 01676706: Unit 2 Service Water Radiation Monitor Indication Erratic; June 30, 2014
- CY-AA-160-100: Analytical Results-Liquid Scintillation Efficiency Quench Curve; November 1, 2013
- CY-QC-120-735: Main Chimney and Reactor Vent Noble Gas Release Rate Action Levels; Revision 8
- CY-QC-130-308: Tennelec Alpha/Beta Calibration Data; November 18, 2013
- CY-QC-130-3001: High Purity Germanium Detector-4 Calibration; December 13, 2013
- CY-QC-130-3001: High Purity Germanium Detector PARAPS-42 Calibration; December 13, 2013
- QDC-13-001: Unconditional Release Detection Thresholds and Dose Consequences; March 31, 2014
- RP-AA-700: Controls for Radiation Protection Instrumentation; Revision 3

- RP-AA-700-1210: IPM-342 Calibration Data Sheet; January 13, 2014
- RP-AA-700-1401: Calibration Data Sheet PM-7 Portal Monitor; September 4, 2013
- RP-AA-700-1501: Small Articles Monitor Source Reference; December 31, 2013
- WO-01470186: Radwaste Effluent Monitor Calibration; February 21, 2014
- WO-1589726: Drywell Radiation Monitor Calibration and Functional Test; May 17, 2014
- WO-01608168: Mid-range Noble Gas Monitor Calibration; June 26, 2014
- WO-01608170: High-range Noble Gas Monitor Calibration; June 26, 2014
- WO-01718112: Reactor Building Vent/Fuel Pool Radiation Monitor Calibration; June 3, 2014
- WO-01751151: Service Water Monitor Calibration; July 14, 2014
- Update Final Safety Analysis Report, Section 12; Revision 12
- Update Final Safety Analysis Report, Section 11; Revision 11

Section 4OA1

- Nuclear Energy Institute (NEI) Document 99-02: Regulatory Assessment Performance Indicator Guideline, Revision 7
- Licensee 2013 Performance Indicator Submittals
- QC-MSPI-05: Final Quad Cities MSPI Bases Document; Revision 5b
- Maintenance Rule Database for Z2300: HPCI

Section 4OA2

- IR 1660714: 2C Condenser Backpressure Response is Slow; May 16, 2014
- EACE 1660714-06: 2C Condenser Backpressure Response is Slow; June 23, 2014
- LER 05000265/2014-003-00: RPS Pressure Switch for Condenser Vacuum – Low Inoperable and Exceeded Technical Specifications; July 15, 2014
- IR 1056375: 2C Condenser Backpressure Reads Higher than Expected; April 14, 2010
- ACE 1660714-06: Technical Specification Required Instrument Inoperable Prior to Entry into Mode 1 and Existed for > 12 Hours While in Mode 1; June 4, 2010
- LER 05000265/2010-001-00: Main Condenser Low Vacuum Scram RPS Switch Inoperable Exceeded Technical Specifications; June 11, 2010
- QCOP 4400-09: Circulating Water System Flow Reversal; Revision 26
- QCOP 4400-09: Circulating Water System Flow Reversal; Revision 27
- IR 1662689: 2-3199-75A/B Extent of Condition Documentation; May 21, 2014
- IR 1678894: Incorrect ID of Fire Detect Sys Results in Missed Fire Watch
- IR 1648259: NRC SRI Questions on Start Failure Relay Qualified Life; April 16, 2014
- ER-AA-200: Preventative Maintenance Program; Revision 0
- IR 1674596: EDG Protective Relay Classification Actions Needed; June 24, 2014
- IR 1638768: U0 EDG Start Failure Relay Replacement – EOC for U2 SF Relay; April 26, 2014
- IR 1638763: U1 EDG Start Failure Relay Replacement – EOC for U2 EDG SF; April 26, 2014
- IR 1611255: U2 EDG Start Failure Relay Failure During Surveillance; January 23, 2014

Section 4OA3

- IR 1660714: 2C Condenser Backpressure Response is Slow; May 16, 2014
- EACE 1660714-06: 2C Condenser Backpressure Response is Slow; June 23, 2014
- LER 05000265/2014-003-00: RPS Pressure Switch for Condenser Vacuum – Low Inoperable and Exceeded Technical Specifications; July 15, 2014
- QCOP 4400-09: Circulating Water System Flow Reversal; Revision 27
- IR 1694119: QCOA 9900-02 Note for ENS Notification Needs to be Updated; August 19, 2014
- Industrial Scientific Multi-Gas Monitor TMX 412 Instruction Manual; Revision 10

- RP-AA-901, Attachment 2: Air Quality Survey Data Sheet; August 1, 2014
- RP-AA-700-1221, Attachment 1: TMX 412 Calibration Record; July 14, 2014
- RP-AA-901-1013, Attachment 2: T-80/T-82 Gas Monitor Calibration Form; July 14, 2014
- SA-QC-114-1006: Quad Cities RHR Service Water Vault Confined Space Air Monitoring; Revision 2
- IR 1691827: Questionable Information Provided in Ops STN 14-074; August 12, 2014
- IR 1689999; Safety Concern – Improper Control of Confined Spaces; August 7, 2014
- IR 1690020: Potential Missed EAL Call – RHRSW Vault Access Restricted; August 7, 2014
- IR 1694545: Safety – RHR Service Water Vault Air Sample; August 20, 2014
- IR 1693749: Safety- RHR Service Water Vault Air Sample; August 18, 2014
- IR 0515418: Elevated Hydrogen Levels in 1D RHR SW Vault; August 1, 2006
- IR 1553288: Air Quality in B/C RHR SW Vault Failed Monthly Air Quality; September 1, 2013
- IR 1688218: U2 B/C RHRSW Vault Air Sample Results > 10% LEL; August 1, 2014
- SA-AA-114: Confined Space Entry; Revision 16
- EP-AA-1006: Exelon Nuclear Radiological Emergency Plan Annex for Quad Cities Station; Revision 36

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ETE	Evacuation Time Estimate
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
LCO	Limiting Condition for Operation
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
ORO	Offsite Response Organizations
PARS	Publicly Available Records System
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RHRSW	Residual Heat Removal Service Water
RPS	Reactor Protection System
SBGT	Standby Gas Treatment
SDP	Significance Determination Process
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vdc	Voltage Direct Current
WO	Work Order

M. Pacilio

-2-

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

Sincerely,

/RA/

Christine A. Lipa, Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
IR 05000254/2014004; 05000265/2014004
w/Attachments: Supplemental Information
Inspection Checklist

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Attachment 2 - Inspection Checklist for
Section 03.02, "Snubber Program and Inspection Sampling of Selected Snubbers from Snubber Program"

Item No.	Plant Name: <u>Quad Cities - Unit 2</u> Items to Verify in Snubber Program	Inspector Determination and Remarks		
		Yes/No (or N/A)	Completed	Remarks
a.	Snubber Program			
1.	Determine whether the ASME Code edition or addenda in the current snubber program documentation matches the ASME "Code of Record."	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Licensee's "Code of Record" is ASME OM Code, 2004 edition through 2006 addenda
	If they do not match, determine whether the NRC has approved the difference. (Mark "N/A" if the response to the first half of this item was "Yes.")	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
2.	If the licensee is using the TS or any other licensee controlled documents, such as the TRM, determine whether these documents match the ASME "Code of Record."	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The Technical Requirements Manual describes the ASME "Code of Record" as ASME OM Code, 2004 edition through 2006 addenda.
	If they do not match, determine whether the NRC has approved the difference. (Mark "N/A" if the response to the first half of this item was "Yes.")	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
3.	If the snubber program has been converted from Section XI of the ASME B&PV Code to Subsection ISTD of the ASME OM Code during the current 10-year interval, determine whether the snubber program matches the ASME "Code of Record."	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The regulatory requirements for the snubber program have not been converted from Section XI of the ASME B&PV Code to Subsection ISTD of the ASME OM Code during the current 10-year interval.
	If they do not match, determine whether the NRC has approved the difference. (Mark "N/A" if the response to the first half of this item was "Yes.")	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Attachment 2 - Inspection Checklist for
Section 03.02, "Snubber Program and Inspection Sampling of Selected Snubbers from Snubber Program"

Item No.	Plant Name: <u>Quad Cities - Unit 2</u> Items to Verify in Snubber Program	Inspector Determination and Remarks		
		Yes/No (or N/A)	Completed	Remarks
a.	Snubber Program (continued)			
4.	Determine that the licensee documented any corrective action(s) and corrected these conditions in response to RIS 2010-06 and EGM 10-001. (Mark "N/A" if no corrective action(s) were taken by the licensee in response to RIS 2010-06 and EGM 10-001.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The licensee generated a condition report in response to issuance of RIS 2010-06 and EGM 10-001. The licensee reviewed their snubber program and determined the snubber program is in compliance with the regulatory requirements. Therefore, no corrective actions were taken in response to issuance of RIS 2010-06 and EGM 10-001.
b.	Inspection Sampling of Selected Snubbers from Snubber Program			
1.	Snubber Inservice Visual Examination			
(a)	Determine whether selected snubbers are characterized as accessible or inaccessible for visual examination or whether the total population of snubbers is treated as one group without categorizing them as accessible or inaccessible. (Note: Some licensees perform visual examination of accessible and inaccessible snubbers during alternate refueling outages.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The licensee categorizes their snubbers as accessible or inaccessible, but for the purposes of visual examination, they treat the total population of snubbers as one group.

Attachment 2 - Inspection Checklist for
Section 03.02, "Snubber Program and Inspection Sampling of Selected Snubbers from Snubber Program"

Item No.	Plant Name: <u>Quad Cities - Unit 2</u> Items to Verify in Snubber Program	Inspector Determination and Remarks		
		Yes/No (or N/A)	Completed	Remarks
b.	Inspection Sampling of Selected Snubbers from Snubber Program (continued)			
1.	Snubber Inservice Visual Examination (continued)			
(b)	Determine whether visual examination of the selected snubbers was performed during every refueling outage of the current 10-year interval.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The licensee performs visual examinations every 48 months as allowed by Table ISTD-4252-1 of Subsection ISTD of the ASME OM Code.
	If not, and if the visual examination was extended beyond one refueling outage, determine whether the frequency of snubber visual examination is allowed by Table ISTD-4252-1 of Subsection ISTD of the ASME OM Code or other approved document.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
(c)	If visual examination was extended beyond two refueling outages or 48 months as allowed by Table ISTD-4252-1, determine whether the frequency of snubber visual examination was extended to a 10-year interval through the use of Code Case OMN-13, "Requirements for Extending Snubber Inservice Visual Examination Interval at LWR Power Plants."	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The licensee does not use OMN-13 and does not extend visual examinations past 48 months.

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		Yes/No (or N/A)	Completed	Remarks
b.	Inspection Sampling of Selected Snubbers from Snubber Program (continued)			
1.	Snubber Inservice Visual Examination (continued)			
(d)	Review the visual examination records and walk down the selected snubbers. During the walkdowns, look for any deficiencies, such as physical damage, loose bolts, leakage, corrosion, or degradation. Compare the walkdown observations to the actual visual examination records maintained by the licensee. As applicable, determine why any degraded conditions exist and why the licensee's record and observed condition may not be identical.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	No deficiencies noted during the walkdowns.
2.	Snubber Inservice Testing			
(a)	Determine whether the total population of snubbers for testing is considered to be one DTPG (Defined Test Plan Group) or multiple DTPGs based on their size, design, application, or type (hydraulic or mechanical). (Note: The ASME OM Code allows different DTPGs for snubber testing.)	<input type="checkbox"/> Single <input checked="" type="checkbox"/> Multiple	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	For functional testing, there are three groups: <ul style="list-style-type: none"> • Lisega Snubbers Sizes 1, 4, 5 and 6 • PSA Snubbers Sizes 35 and 100 • PSA Snubbers Sizes 1, 3 and 10
(b)	Determine whether the selected snubbers are part of defined DTPGs. (Note: The ASME OM Code requires a defined DTPG for all snubbers.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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		Yes/No (or N/A)	Completed	Remarks
b.	Inspection Sampling of Selected Snubbers from Snubber Program (continued)			
2.	Snubber Inservice Testing (continued)			
(c)	For PWRs, if the selected snubbers are attached to steam generators (SGs) or reactor coolant pumps (RCPs), determine whether these snubbers are tested as part of a separate group or DTPG containing only SG and RCP snubbers as required by the ASME OM Code.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	N/A
(d)	As applicable, when testing records for selected snubbers show test failures, determine whether an additional sample at least one-half the size of the initial sample was tested as required by the ASME OM Code or any other NRC approved alternative(s).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	There were no test failures during the last two refueling outages; however, it is in the licensee's program to additionally test snubbers in accordance to the guidance provided in ASME OM Code (2004 Edition through the 2006 Addenda) Subsection ISTD, section ISTD-5300.
(e)	Optionally, observe the actual testing of the selected snubbers and determine whether the noted test parameters (e.g., activation, release rate, and drag force).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Test parameters measured were drag force and activation.
(f)	Review the test records of selected sample snubbers and determine whether deficiencies, failures, or anomalies were identified during testing.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	No deficiencies, failures, or anomalies were identified during testing for snubbers that were chosen as sample by inspector.

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		Yes/No (or N/A)	Completed	Remarks
b.	Inspection Sampling of Selected Snubbers from Snubber Program (continued)			
2.	Snubber Inservice Testing (continued)			
(g)	If the licensee is using the ASME OM Code Case OMN-15, "Requirement for Extending the Snubber Operational Readiness Testing Interval at LWR Power Plants," to extend the inservice testing interval, determine whether the use of this Code Case has been approved by the NRC. (Note: Currently Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," dated June 2003, does not list Code Case OMN-15 as an approved Code Case for use. The licensee may only use Code Case OMN-15 if such use has been authorized by the NRC at the licensee's request.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The licensee is not using OMN-15.
3.	Snubber Service Life Monitoring (SLM)			
(a)	Determine whether the selected snubbers are in an SLM program.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

(b)	Determine whether the maintenance activities for the selected snubbers are recorded and included in the SLM Program.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Work Orders are automatically generated to perform preventative maintenance on all snubbers at specified intervals. In addition, a review is performed every two years to ensure snubbers are within service life.
Problem Identification and Resolution				
c.	Verify that the licensee has entered the problems identified during the inspection and testing of snubbers in the licensee's Corrective Action Program. Verify that the licensee is identifying issues at an appropriate threshold when entering them in the Corrective Action Program. Verify that problems included in the licensee's Corrective Action Program are properly addressed for resolution. See Inspection Procedure 71152, "Problem Identification and Resolution," for additional guidance.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The inspector reviewed many condition reports related to snubbers that were entered into the licensee's Corrective Action Program. Most of these issues were visual deficiencies. All were properly addressed and resolved.