UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE RD. SUITE 210
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October 24, 2017

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

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2—NRC INTEGRATED INSPECTION REPORT 05000254/2017003 AND 05000265/2017003

Dear Mr. Hanson:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. On October 13, 2017, the NRC inspectors discussed the results of this inspection with Mr. K. Ohr and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC inspectors did not identify any findings or violations of more than minor significance.

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

Sincerely,

/RA/

Laura Kozak, Acting Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
IR 05000254/2017003; 05000265/2017003

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Letter to Bryan C. Hanson from Laura Kozak dated October 24, 2017

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2—NRC INTEGRATED INSPECTION REPORT 05000254/2017003 AND 05000265/2017003

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REGION III

Docket Nos:	50–254; 50–265
License Nos:	DPR–29; DPR–30
Report No:	05000254/2017003; 05000265/2017003
Licensee:	Exelon Generation Company, LLC
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, IL
Dates:	July 1 through September 30, 2017
Inspectors:	R. Murray, Senior Resident Inspector K. Carrington, Resident Inspector B. Bergeon, Acting Resident Inspector S. Bell, Health Physicist J. Cassidy, Senior Health Physicist A. Dunlop, Senior Reactor Engineer C. Mathews, Illinois Emergency Management Agency
Approved by:	L. Kozak, Acting Chief Branch 1 Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY

Inspection Report 05000254/2017003, 05000265/2017003; 07/01/2017–09/30/2017; Quad Cities Nuclear Power Station, Units 1 and 2; Routine Integrated Inspection Report.

This report covers a three month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-Cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealed Findings

No findings were identified during this inspection.

REPORT DETAILS

Summary of Plant Status

Unit 1

The unit began the inspection period operating at full power (100 percent). On August 15, 2017, the licensee reduced power to 84 percent to perform maintenance on the 1D condensate pump seal. Upon successful repair of the 1D condensate pump seal, the unit was returned to full power on August 17, 2017, where it remained through the end of the inspection period. Additional power changes through the inspection period were planned power changes, including turbine testing, control rod pattern adjustments, and power changes as requested by the transmission system operator.

Unit 2

The unit began the inspection period operating at full power (100 percent). On August 6, 2017, the licensee commenced a shutdown and entered forced outage Q2F67 to repair an oil leak from a neutral bushing on the main power transformer. The unit remained in Mode 4 during the transformer maintenance. Upon successful repair of the bushing, the unit was synchronized to the grid and completed Q2F67 on August 12, 2017. The unit was returned to full power on August 16, 2017. On September 23, 2017, the licensee conducted a planned downpower to approximately 80 percent for planned testing and maintenance when they identified an electrohydraulic control fluid leak from turbine control valve number 4, located in the heater bay. The licensee lowered power to approximately 70 percent to isolate the control valve and conduct repairs. The unit was returned to full power on September 25, 2017. Additional power changes through the inspection period were planned power changes, including turbine testing, control rod pattern adjustments, and power changes as requested by the transmission system operator.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

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 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 1A core spray (CS) room cooler maintenance;
- Unit 2 'B' loop residual heat removal (RHR) during Unit 2 forced outage, Q2F67, shutdown cooling operation; and
- Unit 2 auxiliary power lineup during Unit 2 plant startup from forced outage, Q2F67.

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

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On July 25–26, 2017, the inspectors performed a complete system alignment inspection of the Unit 1 Standby Liquid Control system (SBLC) to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Fire Zone (FZ) 1.1.1.4, Unit 2 Reactor Building, Elevation 647'-6", Third Floor;
- FZ 11.3.3, Unit 2 Reactor Building, Elevation 544'-0", NW Corner Room, 2A Core Spray;
- FZ 17.1.1, Unit 1 Transformer Area, Elevation 595'-0", Main Transformer; and
- FZ 17.1.3, Unit 1 Transformer Area, Elevation 595'-0", Reserve Auxiliary Transformer.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan.
The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a

plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- Unit 1 and Unit 2 HPCI rooms.

Documents reviewed during this inspection are listed in the Attachment to this report. This inspection constituted one internal flooding sample as defined in IP 71111.06–05. In addition, the inspectors did not identify a history of cable degradation or failure due to submergence at the site. The underground vaults inspection sample was not performed as defined in IP 71111.06, Section–02.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

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

a. Inspection Scope

On August 28, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On August 6 and August 11, 2017, the inspectors observed the Unit 2 reactor shutdown and startup, respectively, associated with forced outage Q2F67. 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 and Emergency Plan actions and notifications (if applicable).

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

This inspection constituted two quarterly licensed operator heightened activity/risk samples as defined in IP 71111.11–05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- Unit 1 and Unit 2 HPCI systems; and
- control room ventilation.

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 Title 10 of the *Code of Federal Regulations*(CFR)*,* Section 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 Part 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors performed a quality review for WOs 4639751 and 4626010 for replacement of the HPCI flow indicating switch and safe shutdown makeup flow controller, as discussed in IP 71111.12, Section 02.02.

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 two quarterly maintenance effectiveness samples and one quality control sample as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- Unit 1A adjustable speed drive backup programmable logic controller failure;
- Work Week 17–32–09: Unit 1 online risk and Unit 2 shutdown safety risk during forced outage for Unit 2 main power transformer (MPT2) oil leak;
- Work Week 17–36–13: Planned maintenance on Unit 1 reactor core isolation cooling (RCIC), Unit 2 HPCI, and 2A RHR service water loop; and
- Work Week 17–37–01: Planned maintenance on Unit 1 emergency diesel generator and HPCI systems and Unit 2 RCIC systems.

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:

- Issue Report (IR) 4017529: U.S. Nuclear Regulatory Commission (NRC) Concerns Associated with 1–0203–2D MSIV [main steam isolation valve] Actuator and IR 4050287: U1 Outboard MSIV Slow Closure Troubleshooting Results;
- IR 4021841: Mixed Oil in the 1B core spray (CS) Pump Motor (EC [engineering change] 620110: Evaluate Impact of Mixing Oil Types on 1B Core Spray Pump, Revision 1);
- IR 4042087: U2 Control Rod Drive (CRD) H–09 Elevated Temperature;
- IR 4050176: U1 HPCI Pump Discharge Flow Switch As-found Calibration Check Less than Technical Specification Allowable Value; and
- IR 4054673: Unit 2 CRD Water Analysis Follow Up to IR 4053654.

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 Technical Specification (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 five samples as defined in Inspection Procedure (IP) 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification:

- EC 404184: U2 Upgrade 'A' Feedwater Regulating Valve Internals to Disc Stack.

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

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- 1/2 diesel fire protection pump ('B') monthly test after return to service;
- security diesel generator surveillance after return to service;
- Unit 1 emergency diesel generator timed start test and load test following planned maintenance;
- Unit 2 'B' train residual heat removal (RHR) room cooler thermostat replacement; and
- 'B' control room heating ventilation and air conditioning following corrective maintenance.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the

equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program (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.

1R20 Outage Activities (71111.20)

.1 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for a Unit 2 unscheduled forced outage, Q2F67, that began on August 6, 2017, and continued through August 12, 2017. The licensee shut down the unit because of an oil leak on the neutral bushing of the Unit 2 main power transformer, MPT2. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed and reviewed the reactor shutdown and cooldown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, personnel fatigue management, startup and heat-up activities, and identification and resolution of problems associated with the outage.

Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- QCOS 1100–07: Standby Liquid Control (SBLC) Pump Flow Rate Test, Revision 38 (In-Service Test);

- QCOS 1600–07: Reactor Coolant System Leakage in the Drywell, Revision 40 (RCS);
- QCOS 1000–06: RHR Pump/Loop Operability Test, Revision 58 (In-Service Test); and
- QCIS 0200–61: Unit 2 Division II Main Steam Line Low Pressure Calibration and Functional Test, Revision 8 (Routine);

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

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted one routine surveillance testing sample, two in-service test samples, and one reactor coolant system leak detection inspection sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

.1 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down select effluent radiation monitoring systems to evaluate whether the monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and to observe the materiel condition of the systems.

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with plant documentation and to assess equipment materiel condition. The inspectors also assessed whether there were potential unmonitored release points, building alterations which could impact effluent controls, and ventilation system leakage that communicated directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible, the inspectors reviewed the licensee's materiel condition surveillance records.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent to evaluate whether appropriate treatment equipment was used and the processing activities aligned with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points.

As available, the inspectors observed selected portions of the routine processing and discharging of liquid waste to determine if appropriate effluent treatment equipment was being used and that radioactive liquid waste was being processed and discharged in accordance with procedure requirements and aligned with discharge permits.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.2 Calibration and Testing Program (02.03)

a. Inspection Scope

The inspectors reviewed calibration and functional tests for select effluent monitors to evaluate whether they were performed consistent with the ODCM. The inspectors assessed whether National Institute of Standards and Technology traceable sources were used, primary calibration represented the plant nuclide mix, secondary calibrations verified the primary calibration, and calibration encompassed the alarm set points.

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

The inspectors evaluated the basis for changes to effluent monitor alarm set points.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.04)

a. Inspection Scope

The inspectors reviewed select effluent sampling activities and assessed whether adequate controls had been implemented to ensure representative samples were obtained.

The inspectors reviewed select effluent discharges made with inoperable effluent radiation monitors and assess whether controls were in place to ensure compensatory sampling was performed consistent with the ODCM and that those controls were adequate to prevent the release of unmonitored effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance.

The inspectors reviewed the results of the inter-laboratory comparison program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the inter-laboratory comparison program included hard-to-detect isotopes as appropriate.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.05)

a. Inspection Scope

The inspectors reviewed the methodology used to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with plant documentation, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

The inspectors assessed whether surveillance test results for Technical Specification required ventilation effluent discharge systems met Technical Specification acceptance criteria.

The inspectors assessed calibration and availability for select effluent monitors used for triggering emergency action levels or for determining protective action recommendations.

These inspection activities constituted one complete sample as defined in Inspection Procedure (IP) 71124.06–05.

b. Findings

No findings were identified.

.5 Dose Calculations (02.06)

a. Inspection Scope

The inspectors reviewed significant changes in reported dose values compared to the previous radiological effluent release report to evaluate the factors, which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate.

The inspectors evaluated the isotopes that are included in the source term to assess whether analysis methods were sufficient to satisfy detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides are included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. The inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes have been factored into the dose calculations.

For select radioactive waste discharges, the inspectors evaluated whether the calculated doses where within the 10 CFR Part 50 Appendix I and TS dose criteria.

The inspectors reviewed select records of abnormal radioactive waste discharges to ensure the discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages were reviewed to ensure that an evaluation was made to account for the source term and projected doses to the public.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

.6 Problem Identification and Resolution (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. In addition, they evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

These inspection activities constituted one complete sample as defined in IP 71124.06–05.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

.1 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and dosimeter monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition.

The inspectors reviewed calibration and maintenance records for select air samplers, dosimeters, and composite water samplers to evaluate whether they demonstrated adequate operability of these components.

The inspectors assessed whether the licensee had initiated sampling of other appropriate media upon loss of a required sampling station.

The inspectors observed the collection and preparation of environmental samples from select environmental media to determine if environmental sampling was representative of the release pathways specified in the ODCM and if sampling techniques were in accordance with procedures.

The inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the Updated Final Safety Analysis Report (UFSAR), U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments were operable.

The inspectors evaluated whether missed and/or anomalous environmental samples were identified and reported in the annual environmental monitoring report. The inspectors selected events that involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement to determine if the licensee had identified the cause and had implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results and reviewed any associated radioactive effluent release data that was the source of the released material.

The inspectors selected structures, systems, or components that involve or could reasonably involve a credible mechanism for licensed material to reach ground water, and assessed whether the licensee had implemented a sampling and monitoring program sufficient to detect leakage to ground water.

The inspectors evaluated whether records important to decommissioning, as required by 10 CFR Part 50.75(g), were retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as the result of changes to the land census, long-term meteorological conditions, or modifications to the sampler stations since the last inspection. The inspectors reviewed technical justifications for any changed sampling locations to evaluate whether the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

The inspectors assessed whether the appropriate detection sensitivities with respect to the ODCM where used for counting samples. The inspectors reviewed the quality control program for analytical analysis.

The inspectors reviewed the results of the licensee's inter-laboratory comparison program to evaluate the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the inter-laboratory comparison test included the media/nuclide mix appropriate for the facility. The inspectors reviewed the licensee's determination of any bias to the data and the overall effect on the radiological environmental monitoring program.

These inspection activities constituted one complete sample as defined in IP 71124.07–05.

b. Findings

No findings were identified.

.2 GPI Implementation (02.03)

a. Inspection Scope

The inspectors reviewed monitoring results of the groundwater protection initiative to evaluate whether the licensee had implemented the program as intended and to assess whether the licensee had identified and addressed anomalous results and missed samples.

The inspectors evaluated the licensee's implementation of the minimization of contamination and survey aspects of the groundwater protection initiative and the Decommissioning Planning Rule requirements in 10 CFR 20.1406 and 10 CFR 20.1501.

The inspectors assessed whether unmonitored leaks and spills where evaluated to determine the type and amount of radioactive material that was discharged. The inspectors assessed whether the licensee completed offsite notifications in accordance with procedure.

The inspectors reviewed evaluations of discharges from onsite contaminated surface water bodies and the potential for ground water leakage from them. The inspectors assessed whether the licensee properly accounted for these discharges as part of the effluent release reports.

The inspectors assessed whether on-site ground water sample results and descriptions of any significant on-site leaks or spills into ground water were documented in the Annual Radiological Environmental Operating Report or the Annual Radiological Effluent Release Report.

The inspectors determined if significant new effluent discharge points where updated in the ODCM and the assumptions for dose calculations were updated as needed.

These inspection activities constituted a partial sample as defined in IP 71124.07–05.

b. Findings

No findings were identified

.3 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors assessed whether problems associated with the radiological environmental monitoring program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved the radiological environmental monitoring program.

These inspection activities constituted one complete sample as defined in IP 71124.07–05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator (PI) for the period from the third quarter 2016 through the second quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, and NUREG–1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders (WOs), issue reports, event reports and NRC integrated inspection reports for the period of July 1, 2016, through June 30, 2017, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index—Emergency AC Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI)—Emergency AC Power System PI Units 1 and 2 for the period from the third quarter 2016 through the second quarter 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports and NRC integrated inspection reports for the period of July 1, 2016, through June 30, 2017, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the

previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI emergency AC power system sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.3 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent Technical Specifications (TS)/ODCM radiological effluent occurrences PI for the period from the third quarter of 2016 through the second quarter of 2017. The inspectors used PI definitions and guidance contained in the NEI Document 99–02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one radiological effluent TS/ODCM radiological effluent occurrences sample as defined in IP 71151–05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action program at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's

corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

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

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected the following condition reports for in-depth review:

- Inspection Report (IR) 4049051: OOT [Out of Tolerance] Replacement Recommendation for PS 1–5741–195A; and IR 4049009: OOT Review Recommendation for NIS 1–0756–APRM4.

The inspectors chose these issues for review because they documented safety-related instruments that were found out of tolerance during calibration checks on multiple occasions.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above condition reports and other related condition reports:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of the root and contributing causes of the problem; and
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition;
- evaluate applicability for operating experience and communicate applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

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

b. Observations and Assessments

The inspectors noted that both IR 4049051 and IR 4049009 documented instruments that were found out of tolerance during two of the previous five calibration checks. Condition report IR 4049051 was closed to an existing WO that was created from IR 2542560, which was written two years prior, in 2015. In review of IR 2542560, the inspectors noted the IR was written for the same reason as IR 4049051; the same instrument had failed two of the previous five calibrations. The inspectors noted that the WO to replace the pressure instrument had been in planning stages for 2 years with no work performed. The inspectors informed the licensee of their concern; however, the inspectors also noted that although the pressure instruments were found out of tolerance, they were still within the expanded tolerance band and thus, did not impact operability of the reactor building ventilation system.

4OA5 Other Activities

.1 (Closed) Unresolved Item 05000254/2013003–03; 05000265/2013003–03: Failure to Assess Impact of Relocating Portable Pumps Offsite

a. Inspection Scope

During the 2013 Triennial Heat Sink Inspection, the inspectors identified an unresolved item concerning the licensee's failure to perform a Title 10 of the *Code of Federal Regulations* (CFR) Part 50.59 evaluation for the facility change involving the relocation of the portable pumps used to replenish the ultimate heat sink. Specifically, the licensee did not evaluate the increased likelihood of failure based on the removal of the pumps from the site. The inspectors were concerned that removing the pumps from the site decreased the existing redundancy, diversity and defense in depth because the site was no longer relying on onsite pumps with backup capabilities and now solely relied on the backup pumps. The licensee did not consider the increased likelihood of failure due to: (1) potential unavailability from the vendor due to other external events or competing interests; or (2) an accident occurring during transport which may prevent or significantly delay delivery. In addition, the inspectors determined the licensee had not completed or initiated the actions stated in the 10 CFR 50.59 screening to support the conclusions of no negative impact. Specifically, the licensee stated a predefined would be established to periodically verify the availability of pumps. This predefine was not created. In addition, the licensee stated an actual demonstration including delivery and setup would be accomplished on a routine basis. No such activities were completed.

To address the inspectors' concerns, the licensee initiated IR 1418982, "Godwin Pump Relocation," to perform the 10 CFR 50.59 Safety Evaluation and IR 1416480, "Godwin Pump Performance Not Routinely Checked," to create a periodic surveillance to demonstrate performance of Godwin pumps including the physical delivery of pumps.

In response to IR 1416480, the licensee established a predefine (PMRQ 38437–02) to demonstrate delivery and operation of the offsite pumps by conducting QCOS 0010–17, "Portable Diesel Pump Surveillance," on a five year test frequency. On September 10, 2014, the licensee commenced the above testing under WO 166050201 and were able to successfully demonstrate the setup of the offsite pumps and their ability to discharge water from the discharge canal to the crib house intake within the 24 hours (approximately 22 hours) of initial notification of the loss of dam and contacting the pump vendor. The procedure, however, identified an acceptance criteria

of 48 hours from the notification of the pump vendor to establishing flow to the crib house. Based on the 59.59 evaluation and results of the Ashton study, "Study of Mississippi River Water Stage at Quad Cities Nuclear Power Station," dated April 27, 1998, during the first 24 hours of the loss of dam event, the licensee may not have knowledge of an issue with the dam such that the 48 hours noted would include both the time to identify the event and the time for the vendor to transport and setup the pumps onsite. The licensee recognized this discrepancy and QCOS 0010–17, Revision 2, updated the procedure's acceptance criteria to 24 hours. The licensee also completed Engineering Change (EC) 395566, "Evaluation of Godwin DPC300 Pump Capacity to Provide Sufficient Makeup Flow to the Ultimate Heat Sink," Revision 1, to ensure that the types of portable pumps to be supplied by the vendor will be capable to provide the 5100 gallons per minute from the discharge canal to the crib house. The inspectors reviewed the test procedure, EC 395566, and witnessed the pump demonstration to verify the licensee appropriately resolved the inspectors concern.

In response to IR 1418982, the licensee reevaluated the issue of moving the pumps offsite and concluded that a 10 CFR 50.59 evaluation was required based on the change having an adverse effect on the plant. The licensee completed a 10 CFR 50.59 evaluation, QC–E–2017–002, Revision 0, "UFSAR Change: UFSAR–99–R6–165," which concluded U.S. Nuclear Regulatory Commission (NRC) approval was not required for the change. The evaluation addressed the inspectors concerns documented in the unresolved item and provided adequate analysis to verify that the relocation of the pumps from being maintained onsite to being maintained by a vendor would not require a license amendment to implement the changes. The inspectors reviewed the evaluation and did not identify any concerns with the conclusion.

The inspectors also reviewed Exelon Contract No. 00581470, dated June 20, 2016, with Xylem Dewatering Solutions, Inc. and the vendor's proposal for meeting the contract, Quad Cities Nuclear Power Station Preplan Rental Quotation 106013624, dated May 16, 2016, to provide the required pumps, hoses, personnel, etc. to the site and operational within 24 hours of being notified by the licensee as stated in the UFSAR and the 50.59 evaluation. The inspectors reviewed vendor documents to ensure the pumps were being adequately maintained and tested per "Engine Powered Pump Inspection Checklist," dated September 7, 2012. The licensee also performed routine drills with the vendor per QCOS 0010–17 to ensure they maintained the required equipment available and would be able to deliver, setup, and operate the pumps within 24 hours. The inspectors did have an issue with the predefine PMRQ 38437–01, "Simulate Response to Loss of Lock & Dam 14," completed on May 16, 2016, in the acceptance criteria was stated as the equipment being onsite within 24 hours versus the equipment being setup and operational within 24 hours. Discussions with the licensee indicated the PMRQ acceptance criteria intent was to estimate the total time for equipment to be operational to match the discussion in the 50.59 evaluation. The licensee initiated IR 4038660, "Clarification to Godwin Pump PMRQ," to clarify the PMRQ.

The failure to perform evaluation was considered a minor violation of 10 CFR Part 50.59, "Changes, Tests, and Experiments," Section (d)(1), which requires the licensee to maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant 10 CFR 50.59(c). These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment. The violation was considered minor because even though a 50.59 evaluation was not performed, the licensee did have an

analysis to show that the change from having the pumps onsite to being provided from an offsite vendor was not a significant change that would have affected the mitigation of the loss of lock and dam event. The licensee had entered this issue into their corrective action system as IR 01418982 and completed a 50.59 evaluation as discussed above. This failure to comply with 50.59 constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 13, 2017, the inspectors presented the inspection results to Mr. K. Ohr, 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 Ultimate Heat Sink Unresolved Items inspection was conducted by phone with Mr. T. Petersen, NRC Coordinator/Regulatory Engineer, on August 3, 2017.
- The results of the Radiation Safety Program review with Mr. K. Ohr, Site Vice President, on September 22, 2017.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Ohr, Site Vice President
H. Dodd, Plant General Manager
W. Beck, Regulatory Assurance Manager
J. Bries, Operations Director
T. Bell, Engineering Director
J. Woolridge, Chemistry Manager
D. Collins, Radiation Protection Manager
M. Anderson, Maintenance Director
M. Humphrey, Regulatory Assurance
T. Petersen, Regulatory Assurance
T. Scott, Work Management Director
B. Wake, Senior Manager Operation Support and Services
J. Cox, Shift Operations Superintendent
T. Wojcik, Engineering Manager
R. Earley, Outage Manager
M. Bridges, Engineering Manager
R. Craddock, Organizational Effectiveness Manager
G. Harris, Fleet Assessment

U.S. Nuclear Regulatory Commission

R. Murray, Senior Resident Inspector
B. Bergeon, Acting Resident Inspector
K. Carrington, Resident Inspector

Illinois Emergency Management Agency

C. Mathews, IEMA
A. Settles, IEMA

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

05000254/2013003–03; 05000265/2013003–03	URI	Failure to Assess Impact of Relocating Portable Pumps Offsite (Section 4OA5.1)

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 Number	Document Number	Description or Title	Revision or Date
Section 1R01			
1R01	QCOA 0010–22	Local Intense Precipitation Response Procedure	9
1R01	QCOA 0010–16	Flood Emergency Procedure	26
1R01	QCTP 0130–11	Internal Flood Protection Program	5
1R01	UFSAR Section 3.4.1.1	External Flood Protection Measures	13
1R01	EC 393258	Evaluate the Effects of the Local Intense Precipitation (LIP) Event and the River Flood Event—Fukushima	1
1R01	CC–AA–201	Plant Barrier Control Program	11
1R01	IR 2452133	PSU: 1/2 Trackway Outer Door Deficiencies	02/13/2015
1R01	IR 4018949	1/2 Interlock Door 159 Deteriorated	06/06/2017
1R01	WO 1771324	1/2 Trackway Outer Door 159 Deficiencies	
1R01	WO 4649376	MM Repair/Replace 1/2 Interlock Outer Door 159 Deteriorated	
1R01	IR 4036852	NRC Question for QCOA 0010–22, Local Intense Precipitation	07/28/2017
Section 1R04			
1R04	ER–AA–2003	System Performance Monitoring and Analysis	13
1R04	MA–AA–716–230	Predictive Maintenance Program	11
1R04	OP–QC–102–106	Operator Response Time Program at Quad Cities	7
1R04	QCOP 1100–01	Standby Operation of Standby Liquid Control System	13
1R04	QCOP 1100–02	Injection of Standby Liquid Control	12
1R04	Drawing M–40	Diagram of Standby Liquid Control Piping	AZ
1R04	Drawing M–82	Diagram of Standby Liquid Control Piping	AO
1R04		Unit 1 ENGAGE Health Report for SC1100—Standby Liquid Control System	04/01/2017-06/30/2017
1R04	M–79	Diagram of RHR Service Water Piping	BJ
1R04	M–81 Sheet 1	Diagram of Residual Heat Removal Piping	BX
1R04	M–81 Sheet 2	Diagram of Residual Heat Removal Piping	BL
1R04	M–81 Sheet 3	Diagram of Residual Heat Removal Piping	F
1R04	QCOP 1000–05	Shutdown Cooling Operation	54

1R04	IR 4041706	NRC ID'd Housekeeping Items in 2B RHR Room	08/08/2017
1R04	QCGP 1–2	Normal Unit 2 Startup	29
1R04	QCOP 6500–09	Energizing 4kV Switchgear and Transferring Auxiliary Power	20
Section 1R05			
1R05	OP–AA–201–008	Pre-Fire Plan Manual	4
1R05		Fire Hazards Analysis Methodology and Assumptions	21
1R05	QDC–Fire–11	Quad Cites Generating Station Pre-Fire Plan: Fire Zone 1.1.1.4, Unit 2 RB 647'-6" Elev. Third Floor	October 2013
1R05	QDC–Fire–11	Quad Cites Generating Station Pre-Fire Plan: Fire Zone 11.3.3, Unit 2 RB 544'-0" Elev. NW Corner Room—2A Core Spray	October 2013
1R05	QDC–Fire–11	Quad Cites Generating Station Pre-Fire Plan: Fire Zone 17.1.1, Unit 1 TA 595'-0" Elev. Main Transformer	February 2017
1R05	QDC–Fire–11	Quad Cites Generating Station Pre-Fire Plan: Fire Zone 17.1.3, Unit 1 TA 595'-0" Elev. Reserve Auxiliary Transformer	February 2017
Section 1R06			
1R06	QCTP 0130–11	Internal Flood Protection Program	5
1R06	Drawing FL–1	Flood Barriers Basement Floor	D
1R06	CC–AA–201	Plant Barrier Control Program	11
1R06	QCAP 0250–06	Control of In-Plant Flood Barriers and Watertight "Submarine" Doors	15
1R06	QCTS 0810–10	Reactor Building Internal Flood Barrier Surveillance	8
1R06	EC 405464	Evaluate Potential Impact from Internal Flood Barrier on HPCI	0
Section 1R12			
1R12	Part Evaluation 00099840	Item Equivalency Evaluation for DP flow Indicator Switch CAT ID 0431210–1	
1R12	ER–AA–2030	Conduct of Engineering Manual	18
1R12	IR 4011130	During HPCI S/D MO 2–2301–14 did not auto open	05/15/2017
1R12	WO 4592108	Unit 2 HPCI System Walkdown	05/15/2017
1R12	WO 4592109	Unit 1 HPCI System Walkdown	05/15/2017
1R12		HPCI System Locked High Radiation Area (LHRA) Walkdown	04/28/2017
1R12		Unit 1 and Unit 2 HPCI Walkdown Trending Data	08/17/2015-05/15/2017
1R12	WO 4609110	FNI EWP Clean 2–2301–1 Unit 2 HPCI Room Cooler Low Flow	03/08/2017
1R12	WO 4639751	IM EWP Troubleshoot/Repair FIS 2–2354/MO 2–2301–14	05/15/2017
1R12		Unit 1, Z2300 HPCI, System Health Report	04/01/2017-06/30/2017

1R12		Unit 2, Z2300 HPCI, System Health Report	04/01/2017-06/30/2017
1R12		Unit 0, Z5795 CR HVAC, System Health Report	04/01/2017-06/30/2017
1R12		System Health Report, Control Room HVAC System Monitoring Plan	05/04/2017
1R12		Control Room HVAC Walkdown Trending Data	08/17/2015-05/15/2017
1R12	IR 4044102	MRule A1DE Required for Control Rm HVAC VC5795–03	08/21/2017
1R12		Maintenance Rule Expert Panel Meeting Minutes (VC5795–01, CR HVAC Train B to Provide Radiation Protection / A2DE)	08/24/2017
1R12	WO 4639109–01	IM EWP Troubleshoot 'A' Control HVAC 'B' Chiller Trip	05/15/2017
1R12	WO 4667647–01	FNI Troubleshoot and Repair DPI 0–5795–357	07/26/2017
Section 1R13			
1R13	IR 4037250	1A ASD Minor Trouble and Recirc Drive Trip Alarms 901–4 A5	07/31/2017
1R13	WO 4669237	IM Download Data on 1A ASD PLC B Backup PLC	
1R13	WC–AA–104	Integrated Risk Management	24
1R13	MA–AA–716–234	FIN Team Process	12
1R13	OU–AA–103	Shutdown Safety Management Program	16
1R13	OU–AC–104	Shutdown Safety Management Program Quad Cities Annex	21
1R13	OU–AA–102–1001	Exelon Forced Outage Response	6
1R13	OP–AA–108–117	Protected Equipment Program	4
1R13	QCOS 2300–06	HPCI System Air Operated Valve Test	43
1R13	QCOS 2300–06	HPCI System Air Operated Valve Test	44
1R13		09/04/2017 Work Week Risk Profile	
Section 1R15			
1R15	IR 4021841	QCAP 0400–17 Note Clarification/Oil Mixing Issue	06/14/2017
1R15	IR 4034088	Additional ECCS Pump Motors Identified with Mixed Oil	07/21/2/017
1R15	EC 620110	Evaluate Impact of Mixing Oil Types on 1B Core Spray Pump	1
1R15	OP–AA–108–115	Operability Determinations	19
1R15	IR 4042087	U2 CRD H–09 Elevated Temperature	08/15/2017
1R15	QCOS 0300–21	CRD Temperature Surveillance	20
1R15	QCOP 9950–16	Plant Process Computer Control Rod SCRAM Time Penalty Insertion	14
1R15	IR 4053654	Heavy Contaminants Found in CRD Water to Recirc Seal Filters	09/19/2017
1R15	IR 4054673	NRC Request: Unit 2 CRD Water Analysis Follow Up to IR 04053654	09/21/2017

1R15	IR 4050287	U1 Outboard MSIV Slow Closure Troubleshooting Results	09/08/2017
1R15	EC 621198	Outboard MSIVs May Experience Slower Closure Times at Manifold Temperatures Below 90 Degrees Fahrenheit	0
1R15	IR 4050176	OOT, FIS 2–2354, Trend Code B2	09/08/2017
1R15	QCIS 2300–10	HPCI Pump Discharge Flow Switch Calibration and Functional Test	7
1R15	4E–2530, Sheet 1	Schematic Diagram HPCI System Auxiliary Valves	V
1R15	4E–2527, Sheet 3	Schematic Diagram HPCI System Sensor and Auxiliary Relays	AL
Section 1R18			
1R18	EC 404184	U2 Upgrade ‘A’ FRV Internals to Disc Stack	0
1R18	WO 1901571	Upgrade ‘A’ FRV Internals to Disc Stack per EC 404184	
1R18	Drawing 4E–7888	Schematic and Wiring Diagram Feedwater Regulating Valves Hydraulic System	D
1R18	QCTS 0360–04	Digital Feedwater Level Control System Test Procedure	3
Section 1R19			
1R19	WO 1945966	Cummins Diesel Fire Pump (B) Engine Inspection	
1R19	QCOS 4100–01	Monthly Diesel Fire Pump Test	33
1R19	QCMMS 4100–31	Annual Cummins Diesel Fire Pump Engine Inspection	16
1R19	IR 4038777	Fuel Leak on the 1/2B Fire Diesel	08/03/2017
1R19	WO 1899216	Replace Security Diesel Starting Batteries	08/08/2017
1R19	QCEMS 0100–02	Security Diesel Generator Battery & Charger Inspection	20
1R19	WO 1900524	Security Diesel Inspection	08/09/2017
1R19	QCMPM 9900–01	Security Diesel Generator Surveillance	15
1R19	WO 1946746	Security Diesel Generator Inspection	08/09/2017
1R19	QCOS 9910–01	Security Diesel Generator Monthly Test Run	54
1R19	WO 4674935	Diesel Generator Monthly Load Test (IST)	09/15/2017
1R19	QCOS 6600–41	Unit 1 Emergency Diesel Generator Load Test	53
1R19	QCOS 6600–44	Unit 1 Emergency Diesel Generator Timed Start Test	24
1R19	CO 143137	Replace 2B RHR Room Cooler Thermostat	
1R19	WO 1918765	RHR Area (SE) Cooler 2–5746B Thermostat Replace / Cal (EQ)	09/19/2017
1R19	WO 4689823	Refrigerant Leak on ‘B’ Train of CR HVAC Piping	09/25/2017
Section 1R20			
1R20	QCOP 1000–05	Shutdown Cooling Operation	54
1R20	WO 4668152	Add Oil to Transformer 2 Conservator Tank Due to Oil Leak	07/28/2017
1R20	WO 4668141	EO ID: U2 Main Power Trans Oil Leak (Bushing Replacement)	08/08/2017

1R20	CO 142963	U2 Main Generator OPS CO	08/06/2017
1R20	CO 142964	MPT 2 With High Side Grounds	08/06/2017
1R20	CO 142966	U2 Main Power Transformer Fire Protection	08/06/2017
1R20	CO 142965	MPT 2 Fans and Oil Pumps	08/06/2017
1R20	QOP 6100–08	Restoring Transformer 1(2), Generator 1(2) and Transformer 11(21) to Service	33
1R20	QOP 6100–07	Isolating Transformer 1(2), Generator 1(2) and Transformer 11(21)	38
1R20	IR 4039444	Heater Extraction Valves Did Not Reposition on Turbine Trip	08/06/2017
1R20	IR 4039477	SRM 21 Signal to Noise Failed	08/06/2017
1R20	IR 4039611	U2 MPT H0 Neutral Bushing Failure	08/07/2017
1R20	IR 4039622	Control Rod N–4 Will Not Notch Out	08/07/2017
1R20	IR 4039672	SRM 24 Noise	08/07/2017
1R20	IR 4039887	Elevated U2 Offgas XE–133 Detected During Q2F67 Shutdown	08/07/2017
1R20	IR 4041709	NRC ID'd Oil on Floor Below U2 Torus Bay 1	08/08/2017
1R20	NF–AB–715	Critical Predictions with Powerplex	12
1R20	OP–AB–300–1003	BWR Reactivity Maneuver Guidance	14
1R20	QCGP 2–1	Normal Unit Shutdown	88
1R20	QCGP 1–2	Normal Unit 2 Startup	29
1R20	OP–AA–108–108	Unit Restart Review	19
1R20	OU–AA–103	Shutdown Safety Management Program	16
1R20	OU–QC–104	Shutdown Management Safety Program Quad Cities Annex	21
Section 1R22			
1R22	QCOS 1100–07	SBLC Pump Flow Rate Test	38
1R22	QCOS 1000–06	RHR Pump/Loop Operability Test	58
1R22	ER–AA–321	Administrative Requirements for Inservice Testing	12
1R22	WO 4646578	Div II Main Steam Line Lo Pressure Calc/Func Test	08/17/2017
1R22	QCIS 0200–61	Unit 2 Division II Main Steam Line Low Pressure Calibration and Functional Test	8
1R22	QCOS 1600–07	Reactor Coolant System Leakage in the Drywell (DWFDS and DWEDS Available)	40
Section 2RS6			
2RS6		Quad Cities Radioactive Effluent Release Report for 2015	04/28/2016
2RS6		Quad Cities Radioactive Effluent Release Report for 2016	04/28/2017
2RS6		Offsite Does Calculation Manual (ODCM)	12
2RS6		Land Use Census	2015-2016
2RS6		Liquid Effluent Discharge Batch #734	02/23/2015
2RS6		Inter-Laboratory Comparison Program Data	Fourth Quarter of 2014 to Present
2RS6	CY–QC–110–606	Main Chimney Gaseous & Particulate Sampling	20

2RS6	CY–QC–110–605	Reactor Building Vent Gaseous & Particulate Sampling	12
2RS6		Reactor Building Vent Effluent Sampling Data	09/18-19/2017
2RS6		Main Chimney Effluent Sampling Data	09/18-19/2017
2RS6		Reactor Building Ventilation Radiation Monitor Calibration	05/16/2017
2RS6		Reactor Building Ventilation SPING Calibration	05/02/2017
2RS6		Reactor Building Ventilation SPING Functional Test	05/02/2017
2RS6		Main Chimney SPING Calibration	10/27/2016
2RS6		SBGT 'B' Train in Place DOP Leak Test	07/08/2015
2RS6		SBGT 'B' Train in Place Charcoal Absorber Freon Test	07/08/2015
2RS6		SBGT 'B' Train Installation of New Single Charcoal Tray and DOP & Freon Test	10/08/2015
2RS6		U1 Service Water Radiation Monitor Calibration	01/26/2017
2RS6		Chimney Flow Rate Indication Calibration	07/20/2017
2RS6		10 CFR 61 Data; Report L73167	06/30/2017
2RS6		Radiological Effluent Data	Fourth Quarter of 2016
2RS6	IR 2458003	Radwaste Effluent FR ½–2002–93 Inoperable	02/23/2015
2RS6	IR 2610439	Off-Gas High Rad Likely Due to Putting Cond Demin Online	01/10/2016
2RS6	IR 2655551	Main Chimney Radioactive Effluent Monitoring Vulnerability	04/14/2016
2RS6	IR 3981925	Unit 1 SJAE Rad Monitor Setpoints Require Adjustment	03/06/2017
2RS6	IR 4023395	Main Chimney Radiation Monitor Modification Cancellation	06/19/2017
2RS6	IR 4054620	NRC ID: Improperly Completed QCIS 7500–01 Procedure	09/21/2017
Section 2RS7			
2RS7		Annual Radiological Environmental Operating Report; 2014	05/14/2015
2RS7		Annual Radiological Environmental Operating Report; 2015	05/13/2016
2RS7		Annual Radiological Environmental Operating Report; 2016	05/12/2017
2RS7	CY–QC–170–301	Offsite Dose Calculation Manual; Quad Cities Units 1 and 2	12
2RS7	EN–QC–408–4160	Quad Cities Station Radioactive Groundwater Protective Program Reference Manual	1
2RS7	IR 1041403	External Assessment Results of the RGPP	03/11/2010
2RS7		Peer Assessment Report; NEI 07–07 NEI Ground Water Protection Initiative	03/24/2016
2RS7		50.75(g) Documented Contaminated Areas; K: RP/50.75.g	

2RS7		Pump Maintenance; Station Quad Cities, Pump Number Q 770, Environmental Inc.	06/01/2017
2RS7		Pump Maintenance; Station Quad Cities, Pump Number Q 776, Environmental Inc.	06/01/2017
2RS7		Pump Maintenance; Station Quad Cities, Pump Number Q 771, Environmental Inc.	03/16/2017
2RS7		Pump Maintenance; Station Quad Cities, Pump Number Q 775, Environmental Inc.	06/22/2017
2RS7		Pump Maintenance; Station Quad Cities, Pump Number Q 750, Environmental Inc.	02/23/2017
2RS7		Field Rotometer Calibration; Station Quad Cities, Serial Number 91W505576	08/29/2017
2RS7		Field Rotometer Calibration; Station Quad Cities, Serial Number 38432	08/16/2017
2RS7		Field Rotometer Calibration; Station Quad Cities, Serial Number 91W505576	06/01/2017
2RS7		Field Rotometer Calibration; Station Quad Cities, Serial Number 38432	05/17/2017
2RS7		Field Rotometer Calibration; Station Quad Cities, Serial Number 91W505576	03/01/2017
2RS7		Land Use Census; Quad Cities, Year 2015	09/24/2015
2RS7		Land Use Census; Quad Cities, Year 2016	10/06/2016
2RS7	CY–QC–130–309; Attachment 6	Free-Flowing Solids Environmental LLD Determination; Detector BTP368	07/19/2016
2RS7	CY–QC–130–309; Attachment 6	Free-Flowing Solids Environmental LLD Determination; Detector CTP477	07/12/2016
2RS7	CY–QC–130–309; Attachment 6	Free-Flowing Solids Environmental LLD Determination; Detector DTP787	07/05/2016
2RS7		Annual Report on the Meteorological Monitoring Program at the Quad Cities Nuclear Power Station; 2015	07/27/2016
2RS7		Annual Report on the Meteorological Monitoring Program at the Quad Cities Nuclear Power Station; 2016	07/05/2017
2RS7	IR 2623109	Check in Self-Assessment; Radioactive Effluents Control Program/Radiological Environmental Monitoring Program/Radiation Monitoring (RECP/REMP)	06/14/2017
2RS7	IR 2670689	NOSA–QDC–16–04; Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report	07/07/2016
Section 4OA1			
4OA1	NUREG–1022	Event Reporting Guidelines: 10CFR 50.72 and 50.73	3
4OA1	NEI 99–02	Regulatory Assessment Performance Indicator Guideline	7
4OA1	LS–AA–2080	Monthly Data Elements For NRC Safety System Functional Failures	7
4OA1	LS–AA–2001	Collecting and Reporting of NRC Performance Indicator Data	14

4OA1	LS–AA–2200	Mitigating System Performance Index Data Acquisition & Reporting	5
4OA1	ER–AA–440	Emergency Diesel Generator (EDG) Reliability Program	1
4OA1	ER–AA–2008	Mitigating Systems Performance Index (MSPI) Monitoring and Margin Evaluation	4
4OA1	ER–AA–600–1047	Mitigating Systems Performance Index Basis Document	11
4OA1		Operator Narrative Logs	10/01/2016-06/30/2017
4OA1		Radioactive Effluent Summary Data	Third Quarter of 2016-Second Quarter of 2017
Section 4OA2			
4OA2	IR 4031723	U–1 EDG Vent Fan Failed to Start	07/14/2017
4OA2	PI–AA–125–1003	Unit Two HPCI Minimum Flow Valve Investigation	4
4OA2	IR 4041643	Dissolved Oxygen Excursion Observed in RFW and CRD Systems	08/13/2017
4OA2	EC 402731	Prepare an OOT Report for Second Quarter of 2015 per ER–AA–520	0
4OA2	EC 620799	Prepare an OOT Report for Second Quarter of 2017 per ER–AA–520	0
4OA2	ER–AA–520	Instrument Performance Trending	4
Section 4OA3			
4OA3	IR 4011130	Unit 2 HPCI Min Flow Valve Investigation	05/15/2017
4OA3		Power Labs Letter to Quad Cities, Project 31318, Subject: Failure Analysis of Differential Pressure Flow Indicating Switch	07/26/2017
4OA3	IR 4031914	Part 21 Potential Wedge Pin Failure in Anchor Darling Motor	07/13/2017

LIST OF ACRONYMS USED

CAP	Corrective Action Program
CFR	*Code of Federal Regulations*
CRD	Control Rod Drive
CS	Core Spray
EC	Engineering Change
FZ	Fire Zone
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
MPT2	Unit 2 Main Power Transformer
MSIV	Main Steam Isolation Valve
MSPI	Mitigating System Performance Index
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OOT	Out of Tolerance
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SBLC	Standby Liquid Control
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order