



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, IL 60532-4352

October 18, 2016

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 05000254/2016003 AND
05000265/2016003

Dear Mr. Hanson:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. On October 4, 2016, the NRC inspectors discussed the results of this inspection with Mr. S. Darin and other members of your staff. The enclosed report represents the results of this inspection.

Based on the results of this inspection, the NRC inspectors did not identify any findings or violations of more than minor significance. One licensee-identified violation is listed in Section 4OA7 of this report.

If you contest the subject or significance of this non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to: (1) the Regional Administrator, Region III; (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) the NRC Resident Inspector at the Quad Cities Nuclear Power Station.

B. Hanson

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

Sincerely,

/RA/

Karla Stoedter, Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
IR 05000254/2016003; 05000265/2016003

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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: 05000254/2016003; 05000265/2016003

Licensee: Exelon Generation Company, LLC

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

Location: Cordova, IL

Dates: July 1 through September 30, 2016

Inspectors: R. Murray, Senior Resident Inspector
K. Carrington, Resident Inspector
M. Doyle, Acting Resident Inspector
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Approved by: K. Stoedter, Chief
Branch 1
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000254/2016003, 05000265/2016003; 07/01/2016–09/30/2016; Quad Cities Nuclear Power Station, Units 1 and 2; Routine Integrated Inspection Report.

This report covers a 3-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 February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," dated July 2016.

A. NRC-Identified and Self-Revealed Findings

No findings were identified during this inspection.

B. Licensee-Identified Violations

Cornerstone: Occupational Radiation Safety

Violations of very low safety-significance or Severity Level IV that were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1

The unit operated at or near full power for the entire inspection period, with the exception of planned power reductions for turbine testing, control rod pattern adjustments, and power changes as requested by the transmission system operator. In addition, on September 16, 2016, the unit conducted a planned power reduction to approximately 88 percent thermal power to recover control rod H-03 following corrective maintenance. The unit was returned to full power on the same day.

Unit 2

The unit operated at or near full power for the entire inspection period, with the exception of planned power reductions for 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 Readiness For Impending Adverse Weather Condition—Extreme Heat/Drought Conditions

a. Inspection Scope

The inspectors performed a detailed review of the licensee's procedures and preparations for operating the facility during an extended period of time when ambient outside temperature was high and the ultimate heat sink was experiencing elevated temperatures (Week of July 7, 2016, and July 21–24, 2016). The inspectors focused on plant specific design features and implementation of the procedures for responding to or mitigating the effects of these conditions on the operation of the facility's service water systems. Inspection activities included a review of the licensee's adverse weather procedures, daily monitoring of the off-normal environmental conditions, and that operator actions specified by plant specific procedures were appropriate to ensure operability of the facility's normal and emergency cooling systems. Documents reviewed are listed in the Attachment to this report.

These inspections constituted two readiness for impending adverse weather condition samples 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 2 'B' core spray system during Unit 2 'A' core spray system planned maintenance and testing;
- Unit 1 emergency diesel generator (EDG) system following surveillance testing;
- Unit 1 'B' residual heat removal service water (RHRSW) system during Unit 1 'A' RHRSW pump planned maintenance; and
- Unit 2 reactor core isolation cooling (RCIC) system during Unit 2 high pressure coolant injection (HPCI) system sump pump unavailability.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the 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.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On August 17–19, 2016, the inspectors performed a complete system alignment inspection of the diesel driven fire pumps 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) 7.1, Unit 1 Turbine Building, Elevation 628'-6", 250 V Battery Room and FZ 7.2, Unit 2 250 Vdc Battery Room;
- FZ 25.1, 11.4B, LTD Building and Cribhouse Due to Fire Impairments FPI-4191 and FPI-4192;
- FZ 11.3.1, Unit 2 Reactor Building, Elevation 554'-0", Southwest Corner Room; and
- FZ 11.2.2, Unit 1 Reactor Building, Elevation 554'-0", Southeast Corner Room (1B Residual Heat Removal (RHR)).

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 area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Unit 1 and Unit 2 RHRSW vault area.

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

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

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

a. Inspection Scope

On August 8, 2016, 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 September 14 and September 16, 2016, the inspectors observed Unit 1 operators as they performed control rod manipulations to support boron leaching testing and the recovery of control rod H-03 following scram solenoid valve replacement. 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 one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- Unit 2 core spray system.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for 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 one quarterly maintenance effectiveness 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:

- Work Week 16–27–04: Both units online risk change to yellow due to severe weather and thunderstorm warnings and planned maintenance on 1/2 'B' standby gas treatment system;
- Work Week 16–30–07: Planned maintenance on Unit 1 'B' RHR pump seal cooler, emergent work repair of Unit 2 'A' adjustable speed drive cooling, emergent work on 'B' control room emergency ventilation due to toxic gas release, and both units online risk change to yellow due to planned maintenance on Unit 1 125 Vdc battery charger;
- Work Week 16–37–01: Planned maintenance on Unit 1 EDG, Unit 1 HPCI and Unit 2 RCIC surveillances, control rod drive (CRD) boron leaching testing and CRD H–03 recovery, online risk change to yellow; and
- Work Week 16–39–03: Planned maintenance for the Unit 1/2 EDG speed switch replacement and diesel generator cooling water heat exchanger inspection, emergent work to resolve a 125 V ground issue discovered during restoration from 1/2 EDG maintenance.

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:

- Davis Besse tornado issue—unanalyzed condition with high crank case pressure;
- IR 2700535: U1 RCIC Turbine 1B Oil Sight Glass Leak;
- IR 2701902: Minimum Wall Thickness on RHRSW; and
- IR 2690588: CS Outboard Injection Valve, 2–1402–24B, Auxiliary Contacts Failed.

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.

These operability inspections constituted four samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modifications:

- Engineering Change (EC) 405985: Addition of New Isolation Valve and Lok-ring Couplings in 2D1 Feedwater Heater Drain Line 2–3680A–1; and
- EC 398602: Replace the 1B RHR Pump Seal Cooler.

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

This inspection constituted two permanent plant modification samples 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 (PM) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- Testing of the 1/2 'B' standby gas treatment system in accordance with QCOS 7500-07 and QCOS 7500-05 following planned maintenance;
- Testing of the 2A 125 Vdc Battery Charger following replacement of potentiometers and high voltage shutdown relay card;
- Scram time testing following PM recovery of Unit 1 Control Rod H-03;
- Testing of RHR19B and RHR43C following maintenance in accordance with QCOS 1000-50; and
- Testing of the 1/2 EDG following replacement of the speed switch and maintenance on the diesel generator cooling water pump room cooler inspection in accordance with QCOP 6600-14 and QCOS 6600-43.

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.

These inspections constituted five PM 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:

- QCIS 2400–07[08]: Unit 2 Division I[II] Drywell Radiation Monitor Functional Test (Routine);
- QCOS 0500–12: Reactor Protection System Functional (Routine);
- QCOS 6620–10: Station Blackout Diesel Generator 1(2) Endurance/Margin and Full Load Reject Test (Routine); and
- QCOS 6600–26: Diesel Generator Redundant Unit Start Surveillance (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 USAR, 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.

These inspections constituted four routine surveillance testing samples as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors determined if there have been changes to plant operations since the last inspection that may have resulted in a significant new radiological hazard for onsite individuals. The inspectors evaluated whether the licensee assessed the potential impact of these changes and implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard. The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

These inspection activities supplemented those documented in Inspection Report 05000254/2016002; 05000265/2016002 and constituted a complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.2 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

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

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

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

These inspection activities supplemented those documented in Inspection Report 05000254/2016002; 05000265/2016002 and constituted a complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

.3 Problem Identification and Resolution (02.08)

a. Inspection Scope

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

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

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

These inspection activities supplemented those documented in Inspection Report 05000254/2016002; 05000265/2016002 and constituted a complete sample as defined in IP 71124.01–05.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

.1 Source Term Characterization (02.02)

a. Inspection Scope

The inspectors evaluated whether the licensee had characterized the radiation types and energies being monitored and that the characterization included gamma, beta, hard-to-detects, and neutron radiation.

The inspectors assessed whether the licensee had developed scaling factors for including hard-to-detect nuclide activity in internal dose assessments.

These inspection activities constituted one complete sample as defined in IP 71124.04-05.

b. Findings

No findings were identified.

.2 External Dosimetry (02.03)

a. Inspection Scope

The inspectors evaluated whether the licensee's dosimetry vendor was National Voluntary Laboratory Accreditation Program accredited and if the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present and the way the dosimeter was being used.

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading. For personal dosimeters stored on-site during the monitoring period, the inspectors evaluated whether they were stored in low dose areas with control dosimeters. For personal dosimeters that are taken off-site during the monitoring period, the inspectors evaluated the guidance provided to individuals with respect to care and storage of the dosimeter.

These inspection activities constituted a partial sample as defined in IP 71124.04-05.

b. Findings

No findings were identified.

.3 Internal Dosimetry (02.04)

a. Inspection Scope

The inspectors reviewed procedures used to assess internal dose using whole body counting equipment to evaluate whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, the route of intake and the assignment of dose. The inspectors assessed whether the frequency of measurements was consistent with the biological half-life of the nuclides available for intake. The inspectors reviewed the licensee's evaluation for use of portal radiation monitors as a passive monitoring system to determine if instrument minimum detectable activities were adequate to detect internally deposited radionuclides sufficient to prompt additional investigation. The inspectors reviewed whole body counts and evaluated the equipment sensitivity, nuclide library, review of results, and incorporation of hard-to-detect radionuclides.

The inspectors reviewed select internal dose assessments and evaluated the monitoring protocols, equipment, and data analysis.

These inspection activities constituted a partial sample as defined in IP 71124.04-05.

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 Units 1 and 2 for the period from the third quarter 2015 through the second quarter 2016. 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, issue reports, event reports and NRC integrated inspection reports for the period of July 1, 2015, through June 30, 2016, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

These inspections 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 performance indicator for Units 1 and 2 for the period from the fourth quarter 2015 through the second quarter 2016. 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 October 1, 2015, through June 30, 2016, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data

collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

These inspections constituted two MSPI emergency AC power system samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity PI for Units 1 and 2 for the period from the third quarter 2015 through the second quarter 2016. 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 reactor coolant system chemistry samples, TS requirements, issue reports, event reports and NRC integrated inspection reports 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. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two reactor coolant system specific activity samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness PI for the period from the third quarter of 2015 through the second quarter of 2016. 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 assessment of the PI for occupational radiation safety to determine if the indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The

inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one occupational exposure control effectiveness sample as defined in IP 71151-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent Technical Specification/Offsite Dose Calculation Manual radiological effluent occurrences PI for the period from the third quarter of 2015 through the second quarter of 2016. 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 Technical Specification/Offsite Dose Calculation Manual 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 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 Annual Follow-up of Selected Issues: Contaminated Condensate Storage Tank Vortex Calculation

a. Inspection Scope

The inspectors selected the following corrective action document for in-depth review:

- IR 2696835: Contaminated Condensate Storage Tank Vortex Calculation May Not Support Technical Specification Allowable Value.

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

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the 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 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; and
- 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. 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 (Closed) Licensee Event Report 05000265/2016–002: High Pressure Coolant Injection System Declared Inoperable Due to Valve Packing Leak

a. Inspection Scope

On April 25, 2016, the licensee isolated the HPCI system due to a packing leak that was identified on the HPCI motor-operated (MO) outboard main steam isolation valve MO 2–2301–5. The packing leak was identified by operators in the field and they noted that the steam plume from the steam leak was impinging directly onto the valve motor operator limit switch compartment. With steam isolated to the system, the licensee declared HPCI inoperable. The licensee identified that the valve packing in MO 2–2301–5 was a non-modern style of packing that was susceptible to premature degradation and hardening when used in high temperature and pressure applications; however, at the time the packing was installed, the long term effects on this packing were not understood. The licensee replaced the packing with a “modern packing set” made with a graphite material, which is not susceptible to the aging effects from temperature and pressure. The licensee returned the HPCI system to service and declared it operable on April 27, 2016. The inspectors reviewed the licensee’s Licensee Event Report (LER) and Equipment Apparent Cause Evaluation 2660464, including associated corrective action program action items assigned from the equipment apparent cause evaluation.

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

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

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report 05000265/2016–003: Drywell/ Suppression Chamber Differential Pressure and Primary Containment Oxygen Concentration Technical Specification Compliance

a. Inspection Scope

On May 25, 2016, the licensee violated TS 3.6.2.5 and 3.6.3.1 for primary containment parameters when they exceeded the allowed TS outage time without taking the required TS actions. The inspectors reviewed this event and documented a finding in NRC Inspection Report 05000254/2016002; 05000265/2016002. The inspectors reviewed this LER for accuracy of content and reporting requirements.

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

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

b. Findings

No findings were identified.

40A5 Other Activities

.1 Operation of an Independent Spent Fuel Storage Installation at Operating Plants (60855.1)

a. Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and performed in-field observations to assess the licensee's performance as it relates to the operation of the independent spent fuel storage installation (ISFSI). The inspectors evaluated whether changes made to the programs and procedures since the last inspection were consistent with the license or Certificate of Compliance, and did not reduce the effectiveness of the program. The inspectors also reviewed whether changes were evaluated in accordance with the requirements stated in 10 CFR 72.212(b), 10 CFR 50.59, and 10 CFR 72.48. The inspectors independently assessed whether dry cask storage activities were performed in a safe manner and in compliance with approved procedures. The inspectors verified that the licensee has identified each fuel assembly placed in the ISFSI, has recorded the parameters and characteristics of each fuel assembly, and has maintained a record of each fuel assembly as a controlled document.

Specifically, the inspectors observed the licensee perform the following activities: moving spent fuel assemblies into the multi-purpose canister (MPC); moving the transfer cask (HI-TRAC) and the loaded MPC from the spent fuel pool to the decontamination pad; performing a pre-job briefing; performing welding and non-destructive examination; removing water from the MPC; performing radiation surveys; conducting vacuum drying operations; performing helium leak testing; and downloading the MPC from the HI-TRAC into the storage cask (HI-STORM) in the stack-up configuration. The inspectors performed a walk down of the ISFSI pad and performed independent radiation surveys. The inspectors also reviewed the following documents: radiological surveys, selected 72.48 reviews, and records of fuel assemblies and physical inventories.

A review of corrective action reports written since the last ISFSI inspection indicated that the licensee was effectively identifying and correcting conditions adverse to quality.

b. Findings

No findings were identified.

.2 Exelon Fleet Assessment Report Review

a. Inspection Scope

The inspectors reviewed the report for the Exelon mid-cycle fleet assessment conducted from May 2 – 13, 2016. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 4, 2016, 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 inspection results for the Radiation Safety Program review with Mr. K. Ohr, Plant Manager, on September 2, 2016.
- The results of the ISFSI inspection were presented on August 12, 2016, to Mr. A. Scott, Mr. H. Dodd, and other members of the licensee's management and staff. The licensee personnel acknowledged the information presented.

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

Technical Specification 5.7.2, states, in part, that each high-radiation area, accessible to personnel with radiation levels > 1000 mrem/hr at 30 cm (12 in.) from the radiation source or from any surface which the radiation penetrates shall have doors that are locked to prevent unauthorized entry.

Contrary to the above, on April 26, 2016, the licensee identified the locking mechanism for a door was non-functional and could not prevent unauthorized entry to the area.

Specifically, a worker intentionally challenged the locking mechanism to the Unit 2 low pressure heater bay door when the latch opened. The individual left the area and later reported the issue to the radiation protection staff that promptly secured the area with an alternate locking mechanism and determined that the dose rates exceeded 1000 mrem/hr inside the area. The licensee documented this issue in Issue Report 2661096 and reported a PI occurrence under the Occupational Radiation Safety Cornerstone. The inspectors determined that this issue was of very low safety-significance (Green) after reviewing IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008. The inspectors determined that it was not an as-low-as-reasonably-achievable planning issue, there was neither overexposure nor substantial potential for an overexposure, and the licensee's ability to assess dose was not compromised. Therefore, the finding screened as Green (very-low safety significance).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Darin, Site Vice President
K. Ohr, Plant Manager
W. Beck, Regulatory Assurance Manager
T. Bell, Engineering Director
D. Collins, RP Manager
H. Dodd, Operations Director
R. Hight, Maintenance Director
T. Petersen, Regulatory Assurance Lead
A. Scott, Work Management Director
T. Wojick, Engineering Manager
J. Wooldridge, Chemistry Manager

U.S. Nuclear Regulatory Commission

K. Stoedter, Chief, Reactor Projects Branch 1
R. Murray, Senior Resident Inspector
M. Doyle, Acting Resident Inspector

Illinois Emergency Management Agency (IEMA)

C. Mathews, IEMA

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000265/2016-002	LER	High Pressure Coolant Injection System Declared Inoperable Due to Valve Packing Leak (Section 4OA3.1)
05000265/2016-003	LER	Drywell/ Suppression Chamber Differential Pressure and Primary Containment Oxygen Concentration Technical Specification Compliance (Section 4OA3.2)

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.

<u>Section Number</u>	<u>Document Number</u>	<u>Description or Title</u>	<u>Revision or Date</u>
Section 1R01			
1R01		National Weather Service—Watches, Warnings & Advisories (Forecast for Cordova, IL)	07/07/2016
1R01	EN-QC-402-0005	Extreme Heat Implementation Plan	4
1R01	OP-AA-102-102	General Area Checks and Operator Field Rounds	14
1R01	OP-AA-108-107-1001	Station Response to Grid Capacity Conditions	6
1R01	IR 2695485	Unexpected 902-4 A5 Recirc Minor Failure Alarm	07/21/2016
1R01	IR 2695495	U1 Battery Room Temp Out of Spec on Rounds	07/21/2016
1R01	QCOP 0010-10	Required Hot Weather Routines	22
Section 1R04			
1R04	QCOP 1400-08	Unit 1 Corespray System Preparation for Standby Operation	3
1R04	QCOP 6600-23	Unit 1 Diesel Preparation for Standby Operation	2
1R04	IR 2696537	NRC ID'D Issues Found in B/C RHR SW Vault	07/25/2016
1R04	QCOP 1000-31	RHR Service Water Pump Venting	15
1R04	QOM 1-1000-05	U1 RHR Service Water Valve Checklist	22
1R04	Drawing M-27, Sheet 1	Diagram of Fire Protection Piping	QM
1R04	IR 2546369	Fire Pump Diesel Raw Water Strainers	08/26/2015
1R04	IR 2624373	Blockage of 1/2A Diesel Fire Pump Suction Strainer	02/10/2016
1R04	IR 2668681	MM Through Wall Leak of Fire Piping for ½ 'A' Fire Diesel	05/12/2016
1R04	IR 2679494	EO ID ½ 'A' Fire Diesel Min Flow Valve Leaking From Patch	06/09/2016
1R04	IR 2680256	Degrading Pressure Switch ½ 'A' Fire Diesel	06/10/2016
1R04	IR 2695402	NRC ID'D Through Wall Leak on 1-4199-6 Getting Worse	07/26/2016
1R04	IR 2696579	Fire Valve 1-4199-74 Stem Is Damaged	07/25/2016
1R04	IR 2706032	NRC ID'D Cracked Isolator on 'B' Fire Diesel	08/18/2016
1R04	IR 2706033	NRC ID'D Potentially Leaking Mercury From Mercoid Switch	08/18/2016
1R04	IR 2706037	NRC ID'D Locked Open Valve Chain Might Not Be Appropriate	08/18/2016
1R04	IR 2706320	NRC ID: ½ 'B' Fire Diesel Walkdown Deficiencies	08/19/2016

1R04	IR 2706405	NRC ID: 0-4199-261 Valve Stem Very Slightly Bent	08/19/2016
1R04	IR 2706422	NRC ID'D—Line ½-41278-10" & ½- 4105B-10"—O Questions	08/19/2016
1R04	QCOA 4100-02	Fire Protection System Failure	9
1R04	QCOP 4100-03	Diesel Fire Pump Operation	20
1R04	QOM 0-4100-02	Unit 0 Fire Protection Valve Checklist (Crib House & Misc)	17
1R04	System IQ	System Health Report—Common Unit: Fire Protection Detection Systems (4100B)	04/01/2016-06/30/2016
1R04	System IQ	System Health Report—Common Unit: Fire Protection Barriers (4100C)	04/01/2016-06/30-2016
1R04	WO 1858159-01	Install Upgraded Strainer on the 1B Fire Diesel Pump 0-4107	08/02/2016
1R04	WO 1858160-01	Install Upgraded Strainer on the ½ 'A' Fire Diesel Pump 0-4108	08/15/2016
1R04	QOM 2-1300-01	RCIC Valves on Rack 2202-58 Checklist (RCIC Room)	4
1R04	QOM 2-1300-02	Unit 2 RCIC Valve Checklist (RCIC Room)	11
Section 1R05			
1R05		Fire Hazards Analysis Methodology and Assumptions	22
1R05		Quad Cities Generating Station Pre-Fire Plan: FZ 7.1, Unit 1 TB 628'-6" Elev. 250 V Battery Room	October 2013
1R05		Quad Cities Generating Station Pre-Fire Plan: FZ 7.2, Unit 2 TB 628'-6" Elev. 250 V Battery Room	July 2009
1R05		Quad Cities Generating Station Pre-Fire Plan: FZ 11.4.B, CH 595'-0" Elev. Ground Floor/Service Water Pumps	July 2009
1R05	FPI-4192	Fire Protection Impairment Permit for ½ 'B' Fire Diesel, Cribhouse 595' Elevation	07/18-21/2016
1R05	IR 2695402	NRC ID'D Through Wall Leak on 1-4199-6 Getting Worse	07/26/2016
1R05	IR 2700228	Appendix R Comp ELP Placement	08/03/2016
1R05	QCAP 1500-01	Administrative Requirements for Fire Protection	36
1R05		Fire Hazards Analysis Methodology and Assumptions	22
1R05	FZ 11.2.2	Unit 1 RB 554'-0" Elev. SE Corner Room—1B RHR Room	
1R05	OP-QC-201-012-1001	RMA Checklist #9 U1 Reactor Bldg., El. 554'-0", U1 Southeast Corner Room (1B RHR)	6
Section 1R06			
1R06	QCAP 0250-06	Unit 1(2); Control of In-Plant Flood Barriers and Watertight Submarine Doors	15
1R06	QCTP 0130-11	Unit 1(2); Internal Flood Protection Program	5
1R06	WO 1650778-01	[Unit 1] Reactor Building Flood Barriers Inspection (Flood Protection)	

1R06	WO 1687922-01	1A RHRSW Vault Penetrations Test (Flood Protection)	
1R06	WO 1722324-01	[Unit 2] 'D' RHRSW Vault Sump Pump Check Valve/High Level Alarm Test	
1R06	WO 1749162-01	[Unit 2] 'B'/'C' RHRSW Vault Sump Pump Check Valve/High Level Alarm Test	
1R06	WO 1762522-01	[Unit 2] Reactor Building Flood Barriers Inspection (Flood Protection)	
1R06	WO 1794283-01	2A RHRSW Vault Bulkhead Door Test (Flood Protection)	
Section 1R11			
1R11		Licensed Operator Training Scenario LOCT-1009-ACORE	24
1R11		Licensed Operator Training Scenario LOCT-1041-ECORE	11
1R11	Q1C24-SM-21	Control Rod Sequence Review and Approval Sheet	09/14/2016
Section 1R12			
1R12	QDC-71504	Failure Analysis of General Electric Auxiliary Contacts	08/11/2016
1R12		MO 2-1402-24B Maintenance Rule Functional Failure Classification Form	09/16/2016
Section 1R13			
1R13		Work Week Safety Profile 16-27-04	07/04/2016
1R13		Work Week Safety Profile 16-30-07	07/25/2016
1R13		Protected Equipment Checklist	07/27/2016
1R13		Work Week Safety Profile 16-37-01	09/12/2016
1R13		Protected Equipment Checklist	09/12/2016
1R13	IR 2716819	NRC Identified Error Message on the RWM	09/12/2016
1R13	IR 2716242	Unexpected OOS Rod Not Fully Inserted RWM Message	09/15/2016
1R13	QCOP 0207-01	Rod Worth Minimizer Operation	25
1R13	QCOP 0207-02	Rod Worth Minimizer Bypass Control	25
1R13		Work Week Safety Profile 16-39-03	09/26/2016
1R13		Protected Equipment Checklist	09/27/2016
1R13	IR 2720852	125 Vdc Ground When Shutting in Circuit 13 (1/2 EDG Control Power)	09/27/2016
Section 1R15			
1R15	IR 2700428	NRC Identified: U1 RCIC Turbine Oil Level at Minimum Level	08/08/2016
1R15	IR 2700535	U1 RCIC Turbine IB Oil Sight Glass Leaks, EO ID	08/04/2016
1R15	IR 2701997	U1 RCIC OB Sight Glass Needs Repair	08/08/2016
1R15	QCOA 1300-04	RCIC Turbine Bearing Oil Low Pressure or Oil High Temperature	10
1R15	B157F02501, Sheet 3	Schematic Diagram Engine Control	N
1R15	Davis Besse Drawing	Schematic Diagram Engine Control For Emergency Diesel Generator 1-1	T19

	B15702501, Sheet 2		
1R15	Davis Besse Drawing F– 16505	Schematic Diagram- Alarm Panel & Contractors EDG 1–2	N
1R15	Davis Besse Drawing F– 16505	Schematic Diagram- Alarm Panel & Contractors EDG 1–1	N
1R15	Drawing 4E– 1350A, Sheet 1	Schematic Diagram Engine Control & Generator Excitation Standby Diesel Generator 1	AR
1R15	Drawing 4E– 1350A, Sheet 2	Schematic Diagram Engine Control And Generator Excitation Standby Diesel Generator 1	AP
1R15	Drawing 4E– 1351B, Sheet 2	Schematic Diagram Diesel Generator 1, 2 Auxiliaries and Start Relays	AE
1R15	Drawing 4E– 1645F	Schematic, Wiring Diagram And Window Display for Annunciator Diesel Generator 1 Panel 2251–10	I
1R15	Drawing 4E– 2350A	Schematic Engine Control And Generator Excitation Standby Diesel—Generator 2	AQ
1R15	IR 2690588	MO 2–1402–24B Aux Contact Picked Up During Surveillance	07/08/2016
1R15	EACE 2690588	MO 2–1402–24B Aux Contact Picked Up During Surveillance	08/18/2016
1R15	WO 1599396	MCC 29–1 Cub B5 CS Pump 2B OTB Disch Valve	08/29/2014
1R15	QCOS 1400–05	Core Spray Motor Operated Valve Local Controller Test	14
1R15	PI-AA–125– 1003	Apparent Cause Evaluation Manual	3
1R15	Drawing 4E– 2431	Schematic Diagram Core Spray System Motor Operated Valves	T
1R15	QCEMS 0250– 11	480-208 Vac Motor Control Center Cubicle Maintenance and Surveillance	68
1R15	HU-AA–104–101	Procedure Use and Adherence	5
Section 1R18			
1R18	EC 405985	Addition of New Isolation Valve and Lok-ring Couplings in 2D1 FW Heater Drain Line 2– 3680A–1	0
1R18	GEK 9597, Volume II	Condenser and Feedwater Heaters	
1R18	EC 398602	Replace the 1B RHR Seal Cooler	1
1R18	QCOS 1000–06	RHR Pump/ Loop Operability Test	56
1R18	WO 1761578	Replace the 1B RHR Seal Cooler per EC 398602	07/21/2016
Section 1R19			
1R19	ANSI N510–1989	Errata to ASME N510–1989 Testing of Nuclear Air Treatment Systems	January 1991
1R19	NED-H-MSD– 12	Standby Gas Treatment System (SGTS) Electric Heating Coil Performance	08/18/1992

		Requirements at Various Airflows, Temperatures and Voltages	
1R19	QCOP 7500-01	Standby Gas Treatment (SBGTS) Standby Operation and Startup	21
1R19	WO 1800730	½ 'B' SBGTS Sesquiannual Operability Test	07/07/2016
1R19	EC 402467	Install New Terminal Board and New 125V/250V Potentiometers	03/11/2016
1R19	QCEMS 0210-02	Battery Charger Testing for Safety Related 125 Vdc Batteries	15
1R19	WO 1837389	Replace 2A 125 Vdc Charger Relay Card	07/18/2016
1R19	WO 1846332	2A-125 Battery Charger Terminal Board & Potentiometer	06/02/2016
1R19	EC 402854	Replace ½ EDG Speed Switch	09/19/2016
1R19	QCOP 6600-14	EDG Cooling Water Pump Manual Operation	17
1R19	QCOS 6600-06	Diesel Generator Cooling Water Pump Flow Rate Test	45
1R19	QCOS 6600-43	Unit ½ Emergency Diesel Generator Load Test	47
1R19	QCGP 3-1	Reactor Power Operations	82
1R19	QCGP 4-1	Control Rod Movements and Control Rod Sequence	47
1R19		Quad Cities U1 Control Rod SCRAM Timing Single Rod Report for 30-11 H-03	09/16/2016 04:55
1R19	NF-AB-720-F-1	Control Rod Sequence Review and Approval Sheet	09/16/2016
1R19	OP-AB-300-1010	Selection of Control Rods for SCRAM Time Testing	0
1R19	QCOP 0207-02	Rod Worth Minimizer Bypass Control	11
1R19	QCOP 0207-01	Rod Worth Minimizer Operation	25
1R19	QCOP 9950-61	Plant Process Computer Control Rod SCRAM Timing	5
Section 1R22			
1R22	QCIS 2400-07	Unit 2 Division I Drywell Radiation Monitor Functional Test	1
1R22	QCIS 2400-08	Unit 2 Division II Drywell Radiation Monitor Functional Test	1
1R22	IR 2697519	U1 SDV Vent and Drain Valves Drifting Closed	07/27/2016
1R22	IR 2699692	Actions to Follow SDV Vent and Drain Issues on Both Units	08/02/2016
1R22	QCOS 0500-02	Manual Scram Instrumentation Functional Test	24
1R22	QCOS 0500-12	RPS Test Switch Functional Test	18
1R22	QCOP 6620-07	SBO DG 1(2) Preparation for Normal Start	16
1R22	QCOS 6620-10	SBO DG 1(2) Endurance/Margin And Full Load Reject Test	36
1R22	QCOS 6600-26	Diesel Generator Redundant Unit Start	28
Section 2RS1			
2RS1	IR 2557223	Accumulated Dose Alarm	09/18/2015
2RS1	IR 2572506	Accumulated Dose Alarm Received in U2 Clean Up Hx Room	10/17/2015

2RS1	IR 2573248	Potential Adverse Trend in Accumulated Dose Alarms	10/19/2015
2RS1	IR 2573804	Declining Trend in Radiation Worker Performance	10/20/2015
2RS1	IR 2647437	Dose Alarm and PCE 2016-04	03/29/2016
2RS1	IR 2646833	Accumulated Dose Alarm	03/28/2016
2RS1	IR 2636075	Unplanned Dose Rate Alarm	03/04/2016
2RS1	IR 2661096	Failure of LHRA Door	04/26/2016
2RS1	ACE 2579293-02	An Adverse Trend in Radiation Worker Performance was Identified by the Work Group Evaluation Performed for IR 2573804	11/24/2015
2RS1	Confirmation Form	2016 Annual Inventory Reconciliation	01/13/2016
2RS1	WO 1861381-01	Leak Testing of Sealed Radioactive Byproduct	03/10/2016
2RS1	RP-AA-220, Attachment 3	Annual Review of the Bioassay Program; 2015	12/31/2015
2RS1	QDC-15-005	Unconditional Release Detection Thresholds and Dose Consequences	12/30/2015
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4OA1	LS-AA-2140	Monthly Data Elements for NRC Occupational Exposure Control Effectiveness	July 2015-June 2016
4OA1	CY-QC-120-720, Attachment 2	Actual Dose Data	July 2015-June 2016
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4OA2	IR 2702073	2-0203-3D ERV Main Disc Valve Temperature Trend	08/08/2016
4OA2	IR 2702079	Trending Data on ERV Pilot Valve From Vendor Testing	08/08/2016

4OA2	WO 1280716-01	ERV As-found Disc Operation Verification	11/06/2009
4OA2	IR 27110088	Part 21—SR Component Welding by an Unqualified Welder	08/30/2016
4OA2	IR 2711935	EO ID: ERV Controller Amber Light Out	09/03/2016
4OA2	4e-2462A	Schematic Diagram Auto Blowdown Part 2	G
4OA2	IR 2696835	CCST Vortex Calculation May Not Support TS Allowable Value	07/26/2016
4OA2	Task Interface Agreement (TIA) 2003-05	NRC Policy Questions on the Technical Specification Adequacy and Related Technical Specification Operability at Brunswick Nuclear Plant	01/16/2004
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4OA5	EC 404923	Quad Cities Unit 1 EOC 23 Fuel Characterization and Classification Update—ISFSI	0
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LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRD	Control Rod Drive
DRP	Division of Reactor Projects
EC	Engineering Change
EDG	Emergency Diesel Generator
FZ	Fire Zone
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
MO	Motor-Operated
MPC	Multi-Purpose Canister
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
PI	Performance Indicator
PM	Post-Maintenance
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
SSC	System, Structure, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vdc	Volts Direct Current
WO	Work Order

B. Hanson

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Sincerely,

/RA/

Karla Stoedter, Chief
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