UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, IL 60532-4352

November 4, 2013

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Co., LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2013004 AND 05000265/2013004

Dear Mr. Pacilio:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. The enclosed report documents the results of this inspection, which were discussed on October 8, 2013, with Mr. T. Hanley, and other members of your staff.

One self-revealed finding of very low safety significance (Green) was identified during this inspection. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Quad Cities Nuclear Power Station. In addition, if you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Quad Cities Nuclear Power Station.

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

Sincerely,

/RA/

Christine Lipa, Chief
Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000254/2013004 and 05000265/2013004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254; 50-265
License Nos:	DPR-29; DPR-30
Report No:	05000254/2013004; 05000265/2013004
Licensee:	Exelon Generation Company, LLC
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, IL
Dates:	July 1 through September 30, 2013
Inspectors:	J. McGhee, Senior Resident Inspector B. Cushman, Resident Inspector J. Draper, Reactor Engineer L. Haeg, Senior Resident Inspector, Duane Arnold Energy Center R. Murray, Resident Inspector, Duane Arnold Energy Center D. Jones, Reactor Inspector J. Bozga, Reactor Inspector S. Bell, Health Physicist V. Myers, Health Physicist M. Mitchell, Health Physicist C. Mathews, Illinois Emergency Management Agency
Approved by:	Christine Lipa, Chief Branch 1 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report (IR) 05000254/2013004 and 05000265/2013004; 07/01/13 - 09/30/13; Quad Cities Nuclear Power Station, Units 1 and 2, Identification and Resolution of Problems. This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified. The finding was considered a non-cited violation (NCV) of NRC regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross Cutting Areas" dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was self-revealed through repetitive low pressure alarms on a recently overhauled control rod drive (CRD) hydraulic control unit (HCU) accumulator. Specifically, the work instructions for overhaul of the HCU for CRD 2-0305-34-59 were not appropriate to the circumstances in that the wrong part number for the bottom O-ring was listed and as a result, the wrong sized O-ring was installed in the safety related application. The wrong O-ring allowed nitrogen pressure to leak out of the HCU accumulator after the HCU was returned to service. After the part discrepancy was identified, the licensee stopped all work on the HCU until the parts list was corrected and the procedure was updated to add the catalogue identification number for each part to the applicable steps. The HCU overhaul was completed and retested satisfactorily. An extent of condition review was performed to identify and evaluate other potential instances where the parts list may have been used. The inspectors determined that the development and implementation of an informal parts list was a significant contributor to the performance deficiency and identified that this issue had a cross-cutting aspect in the area of Human Performance – Work Control in that the licensee did not plan the activity with sufficient rigor to support long-term equipment reliability without reliance on manual actions (H.3(b)).

This performance deficiency was determined to be more than minor because it adversely affected the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of mitigating systems for the Equipment Performance attribute because frequent manual operator actions were required to be taken to maintain reliability of the affected accumulator. The inspectors determined the finding could be evaluated using the Significance Determination Process in accordance with IMC 0609, Appendix A, "The Significance Determination Process (SDP) For Findings At-Power." The inspectors answered "No" to all questions of Exhibit 2, "Mitigating Systems Screening Questions," Section C – "Reactivity Control Systems," and therefore, the finding screened as Green or very low safety significance. (Section 4OA2.4)

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1

Unit 1 operated at 100 percent thermal power throughout the evaluated period with the exception of planned power reductions for routine surveillances, main condenser flow reversals, planned equipment repair, and control rod maneuvers.

Unit 2

Unit 2 operated at 100 percent thermal power with the exception of planned power reductions for routine surveillances, main condenser flow reversals, planned equipment repair, and control rod maneuvers from July 1, 2013 through September 26, 2013, when a ground on a feedwater heating valve control circuit failed, resulting in a loss of feedwater heating transient. Operators took action in accordance with the off-normal operating procedure and annunciator response procedures to lower reactor power and restore feedwater heating. Power was lowered to 60 percent in response to the transient, and repairs were made to the control circuit before power was returned to 100 percent on September 27. The unit operated at 100 percent for the remainder of the evaluated period.

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 walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written.

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 2 'A' core spray system during low pressure coolant system inoperability;
- Unit 2 'B' core spray system during low pressure coolant system inoperability;
- Unit 1 station blackout diesel generator while Unit 1 emergency diesel generator was not available; and
- Unit 2 station blackout diesel generator while Unit 1 emergency diesel generator was not available.

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, 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.

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 September 19, 2013, the inspectors performed a complete system alignment inspection of the Unit 2 high pressure coolant injection 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.

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 11.4A, Crib House Basement, Elevation 559'-8";
- Fire Zone 11.4B, Crib House, Elevation 595', Ground Floor/ Service Water Pumps;
- Fire Zone 11.3.1, Unit 2 Reactor Building, Elevation 544'-0", SW Corner Room - 2B Core Spray;
- Fire Zone 11.3.3, Unit 2 Reactor Building, Elevation 544'-0", NW Corner Room - 2A Core Spray;
- Fire Zone 8.2.7D, Unit 2 Turbine Building, Elevation 615'-6", LP Heater Bay (East)/D Heater Bay;
- Fire Zone 8.2.7D, Unit 2 Turbine Building, Elevation 608'-6", LP Heater Bay (West); and
- Fire Zone 11.1.4, Unit 2 Reactor Building, Elevation 544'-0", HPCI Pump Room.

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.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

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

- Manholes #3 and #4.

This inspection constituted one underground vaults 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 12, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On July 29, 2013, the inspectors observed control room operators during planned maintenance to the Unit 1 125 Vdc system. This maintenance activity removed all power to the Unit 1 control board annunciators. In addition, inspectors monitored control room activities on September 7, 2013, during a power maneuver that lowered reactor power from 100 percent to 20 percent over several hours to support a planned maintenance activity. Both of these activities required heightened awareness on the part of the licensee and were activities with 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.
This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11.

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:

- Z1400: Core Spray;
- Z1600: Pressure Suppression; and
- Z2300: High Pressure Coolant Injection.

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.

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

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- Work Week 13-29-05 (Unit 1 reactor core isolation cooling (RCIC) system unavailable for planned maintenance, Unit 1 RCIC and 'A' core spray room cooler unavailable for planned maintenance, Unit 2 'A' 125 Vdc battery charger load test, 1/2 'B' diesel fire pump out of service for planned maintenance, and Unit 1 emergency diesel generator (EDG) load test);
- Emergent relay failure and replacement (2-0595-134) during Group II primary containment isolation logic testing;
- Work Week 13-25-11 (Unit 2 RCIC unavailable for planned maintenance, Unit 2 'B' core spray unavailable for planned maintenance, emergent failure of the Unit 2 'C2' feed water heater emergency dump valve, and Unit 2 core spray logic testing);
- Work Week 13-37-13 (Unit 2 'A' residual heat removal (RHR) room cooler unavailable for planned maintenance and extension for 2 days during emergent repair, Unit 2 'A' RHR service water system vault cooler unavailable for planned maintenance, Unit 2 standby liquid control pump 'A' planned overhaul, and MCC 28/29-5 automatic transfer logic operability testing); and
- Work Week 13-38-01 (Unit 2 250 Vdc battery charger load test and emergent extension impacting schedule, Unit 1 EDG and EDG cooling water pump out of service for planned maintenance, 1/2 'A' diesel fire pump out of service for planned maintenance, Unit 1 'A' control rod drive pump out of service for planned maintenance, and Unit 1 'B' reactor protection system motor generator removal for overhaul).

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.

The inspections of these maintenance risk assessments and emergent work control activities constituted five 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) 01531642: Non-conservative Target Rock Safety Relief Valve Delay Time in OPL-W [Operating Parameters List - Westinghouse];
- IR 1540591: Entered Unplanned Limiting Condition for Operability for DWEDS [Drywell Equipment Drain Sump] Isolation Valve PAM [Post Accident Monitoring];
- IR 1539089: Unit 1/2 EDG Water Expansion Tank Overflow Line;
- IR 1543335: Unit 2 LPRM [Local Power Range Monitor] 48-09A Failed Upscale;
- IR 1548635: Unit 1 Diesel Generator Field Ground Alarm Received; and
- IR 1563750: Lube Oil Circulating Pump Making Noise (Unit 1 EDG).

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.

This operability determination inspection constituted six samples as defined in IP 71111.15-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- QCOS 1000-04: RHRSW Pump Operability Test Following 4kV Breaker Replacement;
- QCOS 5750-16: Control Room Ventilation Differential Pressure Test Following Ducting Repairs in the Cable Spreading Room;

- QCOS 1600-44: Unit 2 PCI Group II Partial Isolation Test at Power Following Relay Replacement (2-0595-134);
- QCMMS 4100-33: 1(2)-4101B Diesel Driven Fire Pump Annual Capacity Test; and
- QCOP 6600-25: Unit 1 Diesel Generator Start Up Following Repairs to Correct Ground on Field Flash Circuit.

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.

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- QCOS 1600-44: Unit 2 PCI Group II Partial Isolation Test at Power, Revision 22 (Routine);
- QCOS 1600-44: Unit 2 PCI Group II Partial Isolation Test at Power, Revision 22 Following Replacement of Relay 2-0595-121 (Routine);
- QCOS 1600-07: Reactor Coolant Leakage in the Drywell (RCS);
- QCOS 6600-41: Unit 1 Diesel Generator Timed Start Test (IST); and
- QCOS 5750-12: Power Operated Automatic SCIV(s) Isolation Timed Test (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.

This inspection constituted three routine surveillance testing samples, one inservice testing sample, 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.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on September 19, 2013, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the technical support center and the operations support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the CAP.

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

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS5 Radiation Monitoring Instrumentation (71124.05)

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

.1 Inspection Planning (02.01)

a. Inspection Scope

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

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

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

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

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

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

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

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

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

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

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

b. Findings

No findings were identified.

.3 Calibration and Testing Program (02.03)

Whole Body Counter

a. Inspection Scope

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

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

b. Findings

No findings were identified.

Post-Accident Monitoring Instrumentation

a. Inspection Scope

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

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

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

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

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

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

b. Findings

No findings were identified.

Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors

a. Inspection Scope

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

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

b. Findings

No findings were identified.

Instrument Calibrator

a. Inspection Scope

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

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

b. Findings

No findings were identified.

Calibration and Check Sources

a. Inspection Scope

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

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.04)

a. Inspection Scope

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

b. Findings

No findings were identified.

.5 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down effluent radiation monitoring systems, including at least one liquid and one airborne system. Focus was placed on flow measurement devices and all accessible point-of-discharge liquid and gaseous effluent monitors of the selected systems. The inspectors assessed whether the effluent/process monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and observed monitors for degradation and out-of-service tags.

b. Findings

No findings were identified.

.6 Calibration and Testing Program (02.03)

Process and Effluent Monitors

a. Inspection Scope

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

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

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

b. Findings

No findings were identified.

Laboratory Instrumentation

a. Inspection Scope

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

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

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete sample as defined in IP 71124.06-05.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the ODCM/TSs. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the CAP, and were adequately resolved.

The inspectors selected radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite inspection, as warranted, given their relative significance and determined if the issues were entered into the CAP and adequately resolved.

b. Findings

No findings were identified.

Offsite Dose Calculation Manual and Final Safety Analysis Report Review

a. Inspection Scope

The inspectors reviewed the FSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they could be evaluated during inspection walkdowns.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection against the guidance in NUREGs-1301, 1302, and 0133, and Regulatory Guides (RGs) 1.109, 1.21, and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether they were technically justified and maintain effluent releases as-low-as-reasonably-achievable.

The inspectors reviewed licensee documentation to determine if the licensee has identified any non-radioactive systems that have become contaminated, as disclosed either through an event report or the ODCM, since the last inspection. This review provided an intelligent sample list for the onsite inspection of any 10 CFR 50.59 evaluations and allowed a determination if any newly contaminated systems have an unmonitored effluent discharge path to the environment, whether any required ODCM revisions were made to incorporate these new pathways and whether the associated effluents were reported in accordance with RG 1.21.

b. Findings

No findings were identified.

Groundwater Protection Initiative Program

a. Inspection Scope

The inspectors reviewed reported groundwater monitoring results and changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

b. Findings

No findings were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed licensee event reports, event reports and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

The inspectors reviewed effluent program implementing procedures, particularly those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations.

The inspectors reviewed copies of licensee and third party (i.e., independent) evaluation reports of the Effluent Monitoring Program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (i.e., smart sampling).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with the documents reviewed in IP 02.01 above and to assess equipment material condition. Special attention was made to identify potential unmonitored release points (such as open roof vents in boiling water reactor turbine decks, temporary structures butted against turbine, auxiliary or containment buildings), building alterations which could impact airborne, or liquid effluent controls, and ventilation system leakage that communicates directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible due to radiological conditions, the inspectors reviewed the licensee's material condition surveillance records, as applicable.

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 (including sample collection and analysis) to evaluate whether appropriate treatment equipment was used and the processing activities align with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points (e.g., changes subject to a 10 CFR 50.59 review or required NRC approval of alternate discharge points).

As available, the inspectors observed selected portions of the routine processing and discharging of liquid waste (including sample collection and analysis) to determine if appropriate effluent treatment equipment is being used and that radioactive liquid waste is being processed and discharged in accordance with procedure requirements and aligns with discharge permits.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls have been implemented to ensure representative samples were obtained (e.g. provisions for sample line flushing, vessel recirculation, composite samplers, etc).

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to

ensure compensatory sampling was performed consistent with the radiological effluent TS/ODCM and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

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 includes hard-to-detect isotopes, as appropriate.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

Effluent Flow Measuring Instruments

a. Inspection Scope

The inspectors reviewed the methodology the licensee uses to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with radiological effluent TS/ODCM or FSAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

No findings were identified.

Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS required ventilation effluent discharge systems (high-efficiency particulate air and charcoal filtration), such as the standby gas treatment system and the containment/auxiliary building ventilation system, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous radiological effluent release report (e.g., a factor of 5, or increases that approach Appendix I criteria) 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 and based on representative samples of the discharge path.

Inspectors evaluated the methods used to determine the isotopes that are included in the source term to ensure all applicable radionuclides are included within detectability standards. The review included the current 10 CFR 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 since the last inspection to evaluate whether changes were consistent with the ODCM and RG 1.109. 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 (e.g., significant increases or decreases to population in the plant environs, changes in critical exposure pathways, the location of nearest member of the public, or critical receptor, etc.) have been factored into the dose calculations.

For the releases reviewed above, the inspectors evaluated whether the calculated doses (i.e., monthly, quarterly, and annual dose) are within the 10 CFR Part 50, Appendix I, and TS dose criteria.

The inspectors reviewed, as available, records of any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to ensure the abnormal 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 of the discharge to satisfy 10 CFR 20.1501 so as to account for the source term and projected doses to the public.

b. Findings

No findings were identified.

.6 Groundwater Protection Initiative Implementation (02.06)

a. Inspection Scope

The inspectors reviewed monitoring results of the Groundwater Protection Initiative to determine if the licensee implemented its program, as intended, and to identify any anomalous results. For anomalous results or missed samples, the inspectors assessed whether the licensee identified and addressed deficiencies through its CAP.

The inspectors reviewed identified leakage or spill events and entries made into 10 CFR 50.75 (g) records. The inspectors reviewed evaluations of leaks or spills and reviewed any remediation actions taken for effectiveness. The inspectors reviewed onsite contamination events involving contamination of ground water and assessed whether the source of the leak or spill was identified and mitigated.

For unmonitored spills, leaks, or unexpected liquid or gaseous discharges, the inspectors assessed whether an evaluation was performed to determine the type and amount of radioactive material that was discharged by:

- assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and assessing whether a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides; and
- determining whether the licensee completed offsite notifications, as provided in its Groundwater Protection Initiative implementing procedures.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies that contain or potentially contain radioactivity, and the potential for ground water leakage from these onsite surface water bodies. The inspectors assessed whether the licensee was properly accounting for discharges from these surface water bodies as part of their effluent release reports.

The inspectors assessed whether onsite ground water sample results and a description of any significant onsite leaks/spills into ground water for each calendar year were documented in the Annual Radiological Environmental Operating Report for the Radiological Environmental Monitoring Program (REMP) or the Annual Radiological Effluent Release Report for the Radiological Effluent TSs.

For significant new effluent discharge points (such as significant or continuing leakage to ground water that continue to impact the environment if not remediated), the inspectors evaluated if the ODCM was updated to include the new release points.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

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 the licensee's CAP. 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.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

This inspection constituted one complete sample as defined in IP 71124.07-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the annual radiological environmental operating reports and the results of any licensee assessments since the last inspection to assess whether the REMP was implemented in accordance with the TSs and ODCM. This review included reported changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, Inter-Laboratory Comparison Program, and analysis of data.

The inspectors reviewed the ODCM to identify locations of environmental monitoring stations.

The inspectors reviewed the FSAR for information regarding the Environmental Monitoring Program and meteorological monitoring instrumentation.

The inspectors reviewed quality assurance audit results of the program to assist in choosing inspection "smart samples." The inspectors also reviewed audits and technical evaluations performed on the vendor laboratory if used.

The inspectors reviewed the annual effluent release report and the 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," report to determine if the licensee was sampling, as appropriate, for the predominant and dose-causing radionuclides likely to be released in effluents.

b. Findings

No findings were identified.

.2 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and thermoluminescent dosimeter monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition. Consistent with smart sampling, the air sampling stations were selected based on the locations with the highest X/Q, D/Q wind sectors, and thermoluminescent dosimeters were selected based on the most risk-significant locations (e.g., those that have the highest potential for public dose impact).

For the air samplers and thermoluminescent dosimeters selected, the inspectors reviewed the calibration and maintenance records to evaluate whether they demonstrated adequate operability of these components. Additionally, the review included the calibration and maintenance records of select composite water samplers.

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

The inspectors observed the collection and preparation of environmental samples from different environmental media (e.g., ground and surface water, milk, vegetation, sediment, and soil), as available, to determine if environmental sampling was

representative of the release pathways as specified in the ODCM and if sampling techniques were in accordance with procedures.

Based on direct observation and review of records, the inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the FSAR, NRC RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments in the control room and, if applicable, at the tower 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 thermoluminescent dosimeter, or anomalous measurement to determine if the licensee identified the cause and implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and reviewed the associated radioactive effluent release data that was the source of the released material.

The inspectors selected SSCs that involve or could reasonably involve licensed material for which there is a credible mechanism for licensed material to reach ground water, and assessed whether the licensee implemented a Sampling and Monitoring Program sufficient to detect leakage of these SSCs to ground water.

The inspectors evaluated whether records, as required by 10 CFR 50.75(g), of leaks, spills, and remediation since the previous inspection were retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as a result of changes to the land census, long-term meteorological conditions (3-year average), or modifications to the sampler stations since the last inspection. They 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 TSs/ODCM where used for counting samples (i.e., the samples meet the TSs/ODCM required lower limits of detection). The inspectors reviewed quality control charts for maintaining radiation measurement instrument status and actions taken for degrading detector performance. The inspectors also reviewed the results of the vendor's Quality Control Program, including the inter-laboratory comparison, to assess the adequacy of the vendor's program.

The inspectors reviewed the results of the licensee's Interlaboratory Comparison Program to evaluate the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the interlaboratory comparison test included the media/nuclide mix appropriate for the facility. If applicable, the inspectors reviewed the licensee's determination of any bias to the data and the overall effect on the REMP.

b. Findings

No findings were identified.

.3 Identification and Resolution of Problems (02.03)

a. Inspection Scope

The inspectors assessed whether problems associated with the REMP were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. Additionally, they assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved the REMP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

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

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for Quad Cities Units 1 and 2 for the period from the third quarter of 2012 through the second quarter of 2013. The inspectors used performance indicator (PI) guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, to determine the accuracy of the PI data reported during those periods. 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, 2012 through June 30, 2013, 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.

This inspection constituted two safety system functional failure samples as defined in IP 71151-05.

b. Findings

No findings were identified.

Cornerstones: Occupational and Public Radiation Safety

.2 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System (RCS) Specific Activity PI for Quad Cities Nuclear Power Station, Units 1 and 2, for the period from the fourth quarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's RCS 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 RCS sample.

This inspection constituted two RCS Specific Activity samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the occupational radiological occurrences PI for the period from the fourth quarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, 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 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.

This inspection constituted one Occupational Exposure Control Effectiveness sample as defined in IP 71151-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent TS/ODCM Radiological Effluent Occurrences PI for the period from the fourth quarter 2012 through the second quarter 2013. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, 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.

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)

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

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

a. Inspection Scope

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

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

integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Selected Issue Follow-Up Inspection: IR 1549852 – 902-8 E7, EDG 2 Overload Alarm Did Not Clear Following FC [Final Clear]

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting an overload alarm on the Unit 2 emergency diesel generator (EDG) that did not clear as expected after a clearance order was lifted following planned maintenance.

On August 23, 2013, the Unit 2 EDG was returned to service following planned maintenance. A 125 Vdc circuit breaker that provides control power to the EDG field circuit was found tripped open. The circuit breaker was previously closed during the return to service, since it was open as part of the clearance boundary. The licensee performed electrical troubleshooting and found no fault that would explain why the breaker tripped. The inspectors concluded that the licensee exhausted all possible causal factors during troubleshooting. The breaker was then replaced and tested during the EDG load test as part of the post maintenance testing for the activities performed during the planned work window. The inspectors conducted observations of the troubleshooting activities as well as the post maintenance testing of the Unit 2 EDG.

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

b. Findings

No findings were identified.

.4 Selected Issue Follow-Up Inspection: Control Rod Drive Hydraulic Control Unit Accumulator Installed Bottom O-ring Is Incorrect

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting the wrong part had been installed in a safety-related control rod drive (CRD) hydraulic control unit (HCU) accumulator. Issue Report 1521734 identified that the wrong part was an O-ring that is part of the accumulator pressure retaining components and as a result of the wrong sized O-ring, the accumulator nitrogen leakage was excessive. The leakage had previously been reported in IRs 1517963 and 1518056 following the return of the HCU from overhaul on May 24, 2013. While operators were able to maintain the accumulator operable through frequent nitrogen gas recharging, the accumulator was taken out of service for repair on May 29, and the licensee's investigation identified that the wrong O-ring had been installed. Additional details are provided in the finding description.

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

b. Findings

Introduction: A finding of very low safety significance (Green) and associated non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," were self-revealed through repetitive low pressure alarms on a recently overhauled CRD HCU accumulator. Follow-up repair activities identified that the wrong part had been installed in a safety related application.

Discussion: On May 24, 2013, HCU 2-0305-34-59 was restored to service following an overhaul that replaced some consumable components. Within 10 hours of the HCU accumulator being charged to full pressure, the accumulator low pressure alarm was received. The accumulator was recharged in accordance with station procedures, but the low pressure alarm was receives again 12 hours later. Operators were able to maintain the accumulator pressure through frequent recharging to maintain the accumulator operable using station procedures. These actions continued four additional times until May 29 when the control rod was inserted into the core and the HCU was removed from service under WO 1645250 to repair the leak.

Mechanics investigating the source of the leakage determined that the O-ring installed on the nitrogen connection to the accumulator was the wrong size and therefore the nitrogen gas used to pressurize the accumulator was leaking through this connection to atmosphere over time. All repair work was stopped and IR 1521734 was written to identify the condition, determine how the wrong O-ring was installed, and verify the work instructions were correct before the HCU was reassembled. The previous work order (WO 971626) was reviewed. The work order performed the overhaul in accordance with procedure MA-QC-794-200, "Preventative Maintenance of Unit 2 Hydraulic Control Unit." This procedure did not reference the part catalogue identification numbers for the O-rings or the associated lubricant in the procedure, rather used generic instructions to "Lubricate the O-ring with approved lubricant" and "Install O-ring in the instrumentation assembly." The work order contained a hand written parts list that contained two errors, one of which was the wrong catalogue identification number for the O-ring that was leaking.

The licensee determined that the parts list was created by a team of mechanics and a mechanical planner using WO 1088117 which was completed on May 3, 2013, as the template. The parts list was not independently reviewed for accuracy and listed the catalogue identification number for the lower O-ring as 1441238 when it should have been 43545. Both of these part numbers are quality level 2, safety related O-rings, but the wrong O-ring is about 1/8 of an inch smaller in diameter, and unless the two are compared directly it would be very difficult to tell the difference.

The licensee verified the parts required for the HCU overhaul and revised MA-QC-794 to include the catalogue identification numbers in the actionable steps to ensure the correct part is installed where required. Hydraulic Control Unit 2-0305-34-59 was then repaired and returned to service following satisfactory retest. The licensee performed an extent of condition review for HCU rebuilds and identified four other work orders (including 1088117) that used the same parts list. None of the other HCU accumulators exhibited excessive leakage and the licensee performed evaluations to address continued operability with the potential non-conforming condition of the wrong sized O-ring being installed.

Analysis: The inspectors determined that installation of the wrong part in a safety-related application was a performance deficiency that impacted reliability of the accumulator and adversely impacted the work load of the on-shift operating crew. This performance deficiency was determined to be more than minor because it adversely affected the Mitigating systems cornerstone objective to ensure availability, reliability, and capability of mitigating systems. The adverse impact was to the Equipment Performance attribute because frequent manual operator actions were required to be taken to maintain reliability of the affected accumulator.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, Appendix A, “The Significance Determination Process (SDP) For Findings At-Power.” The inspectors answered “No” to all questions of Exhibit 2, “Mitigating Systems Screening Questions,” Section C – “Reactivity Control Systems,” and therefore, the finding screened as Green or very low safety significance.

The inspectors determined that the development and implementation of the informal parts list was a significant contributor to the performance deficiency. Failure to verify the parts list a part of the work planning process was a significant breakdown. As a result, inspectors identified that this issue had a cross-cutting aspect in the area of Human Performance – Work Control in that the licensee did not plan the activity with sufficient rigor to support long-term equipment reliability without reliance on manual actions (H.3(b)).

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances and be accomplished in accordance with these procedures.

Contrary to the above, CRD HCU 2-0305-34-59 was returned to service on May 24, 2013, after maintenance was performed using work instructions and procedures that were not appropriate to the circumstances in that the instructions did not ensure that the correct safety related parts were installed in the assembly. The licensee established MA-QC-794-200, “Preventative Maintenance of Unit 2 Hydraulic Control Unit” as the implementing procedure for overhaul of HCU 2-0305-34-59, an activity affecting quality

and implemented the procedure with work instructions included in WO 971626. As a result of errors in the parts list and lack of detail in the instructions, the wrong O-ring was installed resulting in excessive leakage from the unit's accumulator.

Because this violation was of very low safety significance and it was entered into the licensee's CAP as IR 1521734, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000265/2013004-01, "Wrong Part Installed for CRD HCU").**

The licensee was able to maintain pressure in the accumulator by frequently recharging with nitrogen gas until the repair was initiated under WO 1645250. After the part discrepancy was identified, the licensee stopped all work on the HCU until the parts list was corrected and the procedure was updated to add the catalogue identification number for each part to the applicable steps. The HCU overhaul was completed and retested satisfactorily. An extent of condition review was performed to identify and evaluate other potential instances where the parts list may have been used.

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

.1 Unit 2 Loss of Feedwater Heating

a. Inspection Scope

The inspectors reviewed the Unit 2's response to a loss of feedwater heating that occurred on September 26, 2013, when a fuse blew in the control circuit for feedwater heater level control valves causing all three strings of feedwater heaters to dump extraction steam and operate on emergency level control valves to the main condenser. The diversion of flow of the higher temperature drains and extraction steam to the main condenser caused main feedwater temperature to lower. Operators responded to the event by lowering reactor power using recirculation flow and control rods per the off-normal operating procedure QCOA 3500-01, "Feedwater Temperature Reduction with Main Turbine Online." Reactor power was initially lowered to 60 percent.

Troubleshooting determined that the fuse blew in response to a ground on a valve position indicating circuit. Reactor power was restored to 100 percent on September 27 after repairs and restoration of the feedwater heating system lineups to the normal operating configuration.

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

b. Findings

No findings were identified.

4OA5 Other Activities (Post-Approval Site Inspection for License Renewal (Phase II) IP 71003)

.1 Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant evaluation conducted in February 2013. 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.

.2 (Closed) Unresolved Item (URI) 05000254/2012010-02; 05000265/2012010-02: Questions Regarding Aging Management Inspections on the 16-Foot-Diameter Discharge Piping

a. Inspection Scope

During the 2012 Post-Approval Site Inspection for License Renewal, the inspectors identified an unresolved item (URI) related to a 16-foot-diameter discharge piping. Specifically, the licensee did not physically inspect the piping for aging effects so that the intended functions of this component will be maintained during the period of extended operation. The 16-foot-diameter discharge piping provides an ultimate heat sink function in that during a Lock and Dam No. 14 failure the discharge piping provides suction source for portable pumps to pump cooling water into the suction bay of the residual heat removal service water (RHRSW) pumps and diesel generator cooling water pumps.

The licensee provided additional information that there are no regulatory commitments for performing aging management inspections of the discharge piping. In addition, the one-time inspection of the 96-inch-diameter ice melt line is not credited as a sample for the discharge piping. The ice melt line prevents freezing of the river water entering the plant intake and also performs a support function for the ultimate heat sink.

The 16-foot discharge piping is managed by the Open Cycle Cooling Water System Program. Generic Letter 89-13 is the program credited for aging management for the discharge piping. Generic Letter 89-13 requires inspection on a regular basis of important portions of the piping in the service water system for corrosion, erosion, and biofouling. While the Generic Letter 89-13 Program does not explicitly inspect the discharge piping, the inspection, testing and corrosion monitoring is performed on critical safety related service water components. For the service water components that are monitored for corrosion, acceptance criteria are established related to boundary degradation (i.e., maintaining margin to though-wall leakage). For example, selected portions of the RHRSW piping are inspected on a 6-month frequency as part of License Renewal Commitments. All adverse aging effects discovered during this inspection are entered into the CAP, which includes an extent-of-condition assessment. The discharge piping is included in the same aging management review population as the RHRSW piping and would be included in this extent-of-condition assessment.

In addition, the licensee committed to implementation of additional action to the existing circulating water inspection to document a periodic comparison/review of: river levels, discharge bay levels, circulating water flow operation to identify any unexplained changes. According to the licensee a potential unexplained difference between the river and discharge bay levels would be evaluated to determine if this is an indication of obstruction in the 16-foot discharge piping.

The inspectors did not identify a performance deficiency or violation of NRC requirements. This URI is closed.

b. Findings

No findings of significance were identified.

.3 Temporary Instruction (TI) 2515/182: Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

a. Inspection Scope

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued a guidance document, NEI 09-14, "Guideline for the Management of Buried Piping Integrity" (ADAMS Accession No. ML1030901420) to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, NEI issued Revision 1 to NEI 09-14, "Guidance for the Management of Underground Piping and Tank Integrity," (ADAMS Accession No. ML110700122), with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On November 17, 2011, the NRC issued TI 2515/182 "Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks" to gather information related to the industry's implementation of this initiative.

From August 27 - 29, 2013, the inspectors conducted a review of records and procedures related to the licensee's program for buried pipe, underground pipe, and tanks in accordance with Phase II of TI 2515/182. This review was done to confirm that the licensee's program contained attributes consistent with Sections 3.3 A and 3.3 B of NEI 09-14 and to confirm that these attributes were scheduled and/or completed by the NEI 09-14 Revision 1 deadlines. The inspectors interviewed licensee staff responsible for the Buried Pipe Program and reviewed documentation to determine whether the program was managed effectively.

Based upon the scope of the review described above, Phase II of TI-2515/182 was completed.

b. Observations

The licensee's buried piping and underground piping and tanks program was inspected in accordance with Paragraph 03.02.a of the TI and it was confirmed that activities which correspond to completion dates specified in the program which have passed since the Phase I inspection was conducted, have been completed. Additionally, the licensee's Buried Piping and Underground Piping and Tanks Program was inspected in accordance with Paragraph 03.02.b of the TI and responses to specific questions found in http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf, were submitted to the NRC Headquarters staff.

c. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 8, 2013, the inspectors presented the inspection results to Mr. T. Hanley, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that either none of the material discussed was considered proprietary or material was to be destroyed per the previous agreements.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the Aging Management Follow-up Inspection discussed in Section 4OA5.2 of this report were presented to Mr. M. Wagner, Regulatory Assurance Specialist, and other members of the licensee's staff on August 5, 2013. The licensee personnel acknowledged the inspection results.

- The Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks (TI 2515/182, Phase 2) was discussed with the Mr. T. Hanley, Site Vice President, and other members of the licensee staff on August 29, 2013.

- The inspection results for the areas of Radiation Monitoring Instrumentation; Radioactive Gaseous and Liquid Effluent Treatment; Radiological Environmental Monitoring; RCS Specific Activity; Occupational Exposure Control Effectiveness; and Radiological Effluent TS/ODCM Radiological Effluent Occurrences Performance Indicator Verification were discussed with S. Darin, Plant Manager, on August 30, 2013.

- The inspection results for the area of radiation monitoring instrumentation were discussed with Mr. T. Hanley, Site Vice President, on September 20, 2013.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Hanley, Site Vice President
J. Colgan, Chemistry Supervisor
H. Dodd, Maintenance Director
D. Luebbe, Work Control Manager
T. Petersen, Regulatory Assurance Lead
R. Sieprawski, Training Support Manager
S. Specht, Operations
B. Stedman, Design Engineering
T. Wojcik, NOS Manager

Illinois Emergency Management Agency (IEMA)

C. Settles, IEMA

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000265/2013004-01	NCV	Wrong Parts Installed For CRD HCU (Section 4OA2.4.b)

Closed

05000265/2013004-01	NCV	Wrong Parts Installed For CRD HCU (Section 4OA2.4.b)
05000254/2012010-02; 05000265/2012010-02	URI	Question Regarding Aging Management Inspections on the 16-Foot-Diameter Discharge Pipes (Section 4OA5.2)

Discussed

None

LIST OF DOCUMENTS REVIEWED

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

Section 1R01

- QCOA 0010-16; Flood Emergency Procedure

Section 1R04

- M-3028, Diagram of SBO DG Fuel Oil Piping & Instrumentation
- M-3029, Diagram of SBO DG Engine Jacket Water Piping & Instrumentation
- M-3032, Diagram of SBO DG Starting Air Piping & Instrumentation
- M-3034, Diagram of SBO Diesel Engine Lube Oil Piping and Instrumentation
- M-87, Diagram of Unit 2 High Pressure Coolant Injection HPCI Piping
- QCOP 2300-16; Unit 2 HPCI Preparation for Standby Operation
- QCOP 1400-09; Unit 2 Core Spray System Preparation for Standby Operation

Section 1R05

- Pre-Fire Plan FZ 11.4A; CH [Crib House] 559'-8" Elevation Basement
- Pre-Fire Plan FZ 11.4B; CH 595' Elevation Ground Floor/ Service Water Pumps
- Pre-Fire Plan FZ 11.3.3; Unit 2 RB [Reactor Building] 544'-0" Elev. NW Corner Room – 2A Core Spray
- Pre-Fire Plan FZ 11.3.1; Unit 2 RB 544'-0" Elev. SW Corner Room – 2B Core Spray
- Pre-Fire Plan FZ 8.2.7D; Unit 2 TB [Turbine Building] 615'-6" Elev. LP [Low Pressure] Heater Bay (East)/D Heater Bay
- Pre-Fire Plan FZ 8.2.7D; Unit 2 TB 608'-6" Elev. LP Heater Bay (West)
- Pre-Fire Plan FZ 11.1.4; Unit 2 RB 544'-)" Elev. HPCI Pump Room

Section 1R06

- WO 01562292; (LR) Annual Cable Vault Water Intrusion Inspection

Section 1R11

- QCOA 0900-01; Loss of Annunciators; Revision 13
- Evaluation scenario guide for August 12, 2013 (Second Simulator Session)

Section 1R12

- Enterprise Maintenance Rule Production Database for the following systems:
    - Z1400: Core Spray
    - Z1600; Pressure Suppression
    - Z2300; High Pressure Coolant Injection
- ER-AA-310-1004; Maintenance Rule – Performance Monitoring; Revision 11
- ER-AA-310-1005; Maintenance Rule – Dispositioning Between (a)(1) and (a)(2); Revision 6

- ER-AA-310; Implementation of the Maintenance Rule; Revision 8
- IR 1356994; 2A Core Spray pump Discharge Pressure Low Alarm
- IR 1223228; Received 1B Core Spray Loop Low Pressure Alarm
- IR 1427425; U1 Jockey Fill Pump Quit Qorking
- IR 1371376; 2-14028B Failed to Fully Seat While Performing QCOS 1400-01
- IR 01491799; Q1R22-PSU-MO1-1402-38B 1B Core Spray Min Flow Valve nonfunctional
- IR 01526442; U1 ESS Keep Fill Pump Discharge Pressure High
- IR 01517353; 1B Core Spray Lost Fill Pressure After Run
- IR 01492868; Q1R22-PSU 1B Core Spray Outboard Vent Valve Packing Leak
- IR 01481676; Thread Engagement Issue Downstream of 1-1408-34B
- VETIP Binder C0048; Core Spray Pump
- VETIP Binder C0077; Core Spray System
- NUMARC 93-01; Industry Guideline for Monitoring The Effectiveness of Maintenance at Nuclear Power Plants; Revision 2

Section 1R13

- Work Week Safety Profile 13-29-05
- Work Week Safety Profile 13-31-07
- Work Week Safety Profile 13-35-11
- Work Week Safety Profile 13-37-13
- IR 1550526; Unexpected Lowering of 2C2 FW Heater Level; 8/26/2013

Section 1R15

- IR 01531642; Non-conservative Target Rock SRV Delay Time in OPL-W [Operating Parameters List - Westinghouse]
- IR 1540591; Entered Unplanned LCO for DWEDS Isolation Valve PAM; 7/29/13
- IR 1539089; U1/2 EDG Water Expansion Tank Overflow Line Plugged; 7/24/13
- IR 1543335; U2 LPRM 48-09A Failed Upscale; 8/5/13
- IR 1548635; U-1 Diesel Generator Field Ground Alarm Received; 8/20/13
- IR 01563750, Lube Oil Circulating Pump Making Noise

Section 1R19

- QCOS 1600-44; Unit 2 PCI Group II Partial Isolation Test at Power; Revision 22
- QCOS 1000-04; RHRSW Pump Operability Test; Revision 55
- QCOS 5750-16; Control Room Ventilation Differential Pressure Test; Revision 7
- IR 1548877 WO needed to Inspect the ½ EDG Cables
- WO #1666228; U-1 Diesel Generator Field Ground Alarm Received
- QCOP 6600-25; Unit 1 Diesel Generator Start Up; Revision 2
- ECR 411147 Troubleshooting U-1 DG Ground

Section 1R22

- QCOS 1600-44; Unit 2 PCI Group II Partial Isolation Test at Power; Revision 22
- IR 01539107; Relay 2-0595-121 Failed to Energize During QCOS 1600-44
- QCOS 1600-07; Reactor Coolant Leakage in the Drywell
- WO #1567634; (LR) Diesel Driven Fire Pump B Capacity Test
- QCMMS 4100-33; 1(2)-4101B Diesel Driven Fire Pump Annual Capacity Test; Revision 27
- WO #1659888; (LR) Diesel Generator Load Test (IST)
- QCOS 6600-41; Unit 1 Diesel Generator Timed Start Test; Revision 19

- WO #1644097; Power Operated Automatic SCIV(s) Isolation Time Test
- QCOS 5750-12; Power Operated Automatic SCIV(s) Isolation Time Test

Section 1EP6

- Initial Conditions, Exercise Time Line, and Evaluation Sheet for September 19, 2013 EP training drill

Section 2RS5

- AR 1342309; U2 SJAE Rad Monitors are Reading Low; March 18, 2012
- AR 1345970; U-2 SW Rad Monitor INOP Due to Low System Flow; March 26, 2012
- AR 1430477; Unexpected Transfer of Main Chimney Rad Monitor to Mid-Range; October 23, 2012
- Work Order 01634073; Service Water Effluent Gross Activity Mon Functional Test; July 12, 2013
- Work Order 01454838; Service Water Monitor – Calibration Cycle; January 10, 2013
- Work Order 01454307; U1 Service Water Effluent Gross Activity Monitor Calibration/Functional Test; January 10, 2013
- Work Order 01622707; SJAE Off-Gas Radiation Monitor Functional Test; May 10, 2013
- Work Order 01422638; SJAE Off-Gas Log-Rad Mon Calibration/Functional Test; August 22, 2012
- Work Order 01470186; RadWaste Effluent Monitor-Calibration Cycle; February 21, 2013
- Work Order 01469419; RadWaste Effluent Gross Activity Monitor Calibration/Functional Test; February 21, 2013
- Work Order 01484594; Main Chimney Noble Gas Monitor – Calibration Cycle; April 17, 2013
- Work Order 01484241; Chimney Gas Monitor Calibration/Functional Test; April 18, 2013
- CY-QC-130-3001 Attachment 1; HPGE Calibration Values For Use With CRS/PARAPS System; December 7, 2011
- AR 1175377; Nuclear Oversight Identified: Radiation Protection Improvement Opportunity for Setting Electronic Setpoints; February 13, 2011
- AR 1325216; Power Lab Vendor Audit; November 30, 2012
- AR 1355753; Spare Area Radiation Monitor Needs Repair; April 18, 2013
- AR 1372762; Are Radiation Monitor Power Supply Needs Refurbishment; May 31, 2013
- AR 151165; Self-Assessment: Radiation Monitoring Instrumentation; August 8, 2013
- AR 1480464; Area Radiation Monitor Failed Due to Geiger-Mueller Tube Failure; February 26, 2013
- AR 1526365; Received 902-3 A1 Reactor Building High Radiation for An Area Radiation Monitor Number 9 TIP Room; June 18, 2013
- AR 1557196; 2-1805-9 Area Radiation Monitor Number 9 TIP Room Spiked High, September 11, 2013
- AR 1557369; Trending Area Radiation Monitor Number 9 TIP Room Spiking; September 12, 2013
- AR 1557792; 2-1805-9; Area Radiation Monitor Number 9 TIP Room Spiked High; September 12, 2013
- QCIS 1700-07; Reactor Building Ventilation and Fuel Pool Radiation Monitoring Calibration and Functional Test; Revision 21
- QCIS 2400-04; Unit 2 Division 1 Drywell Radiation Monitor Calibration and Functional Test; Revision 8
- QCIPM 1800-05; Eberline Area Radiation Monitor Calibration; Revision 6

- QCMM 5800-05; Reactor Building Overhead Crane Utilization; Revision 23
- QIP 1800-01; Area Radiation Monitor Calibration; Revision 14
- RadCal Service Report S108324; Electrometer Calibration; May 3, 2013
- RP-AA-230; Operation of the Canberra FastScan Whole Body Counter; Revision 1
- RP-AA-700-1210; Operation and Calibration of the IPM Whole Body Frisking Monitor; Revision 0
- RP-AA-700-1235; Operation and Calibration of the PM-12 Gamma Portal Monitor; Revision 0a
- RP-AA-700-1401; Operation and calibration of Eberline PM-7 Personnel Contamination Monitor; Revision 1
- RP-AA-1401; PM-7 Portal Monitor Calibration; January 28, 2013
- RP-AA-1501; Small Articles Monitor; Revision 1
- RP-QC-753; NMC Multi-channel Continuous Air Monitor Calibration; Revision 9
- WO 1333291; Unit 2 Main Steam Line Log-Rad Monitor Source Check; March 29, 2012
- WO 14568980; Area Radiation Monitor Calibration and Functional Test with Crane; January 18, 2013
- WP 1471259; Unit 1, Drywell Radiation Monitor Calibration/Function Test; February 14, 2013
- WO 1473386; Unit 1 Main Steam Line Log-Rad Monitor Source Check; March 24, 2013
- WO 1648262; Reactor Building Ventilation/Fuel Pool Radiation Monitor Calibration and Functional Test; September 5, 2013
- Calibration of the Canberra FastScan Whole Body Counter System; 96-4920; December 12, 2012
- Certificate of Calibration 10744041; Eberline AMS-4 Number 76729; February 4, 2013
- Certificate of Calibration 10736499; MGP Ram Gam Number 1805; January 15, 2013
- Certificate of Calibration 10737798; Thermo Electron FHZ-612 Number 0606; January 15, 2013
- Certificate of Calibration 10741315; Bicron RSO-50E Number C731E; February 14, 2013
- Certificate of Calibration 10741406; Eberline RO-20AA Number 1300; February 14, 2013
- Certificate of Calibration 10741565; Eberline RO-20AA Number 1211; February 26, 2013
- Certificate of Calibration 10757872; Eberline ASP2-E number 0402; June 20, 2013
- Quad Cities Updated Final Safety Assessment Report; Section 11; Revision 9
- Quad Cities Updated Final Safety Assessment Report; Section 12; Revision 12

Section 2RS6

- AR 1324008; ODCM-U1 Abnormal Liquid Release Via U-1 Kinghole; February 7, 2012
- AR 379536; ODCM-Main Chimney Particulate Found Ripped; June 19, 2012
- AR 1452425; U-2 Adsorber Effluent Activity Increase noted; December 14, 2012
- Liquid Radioactive Waste Discharge Permit Package; February 25, 2013
- CY-QC-130-650 Attachment 2; Inoperable Chemistry Instrument LCO Surveillance; various dates
- QCOS 1700-03; Main Chimney Noble Gas Activity Monitor Outage Report; various dates
- CY-QC-120-729; Liquid Effluent Monitor Alarm Setpoints; Revision 4
- CY-QC-110-606; Main Chimney Gaseous and Particulate Sampling; Revision 18
- CY-QC-120-724; Continuous Liquid Effluent Analysis; Revision 3

Section 2RS7

- Sampling Procedures Manual; Environmental Incorporated Midwest Laboratory; Revision 15
- Quad Cities Hydrogeologic Investigation Report; November 2012
- AR 1450328; Five Year Assessment – Groundwater Protection Initiative; June 28, 2013

- AR 01551445; NRC ID REMP Inspection Non-ODCM Cal Sheet Can Be Enhanced; August 28, 2013
- AR 01552459; NRC ID: REMP Dosimeter Found Mislabeled. Field Corrected; August 30, 2013
- 2011 Annual Radiological Environmental Operating Report; May 2012
- 2012 Annual Radiological Environmental Operating Report; May 2013
- 2011 Annual Land Use Census; August 2011
- 2012 Annual Land Use Census; August 2012
- CY-QC-170-301; Offsite Dose Calculation Manual; Revision 11
- Meteorological Tower Calibration Records; 2013
- NOSA-COMP-12-04; 2012 Chemistry, Radwaste, Effluent and Environmental Monitoring Comparative Report; September 7, 2012
- Unit 1 and Unit 2 HRSS Vent Condensation Analysis; August 28, 2013
- 10 CFR 50.75(g) Documented Contaminated Area Records; Various Records
- Radiochemistry Cross Check Program Results; Second Quarter 2011 through Second Quarter 2013

Section 4OA1

- LS-AA-2140; Monthly PI Data Elements; April 2011 – June 2012
- LS-AA-2090; Monthly Data Elements for NRC Safety System Functional Failures
- Radioactive Effluent Dose Projections; 2012 Fourth Quarter through 2013 Second Quarter
- Internal Dose Calculations; 2012 Fourth Quarter through 2013 Second Quarter
- Electronic Dosimetry Dose Alarms; 2012 Fourth Quarter through 2013 Second Quarter
- Corrective Action Documentation Review for VHRA/LHRA/HRA; 2012 Fourth Quarter through 2013 Second Quarter
- Chemistry Dose Equivalent Iodine Determinations; 2012 Fourth Quarter through 2013 Second Quarter
- Unit 1 and Unit 2 Reactor Water Radionuclide Analysis; August 28, 2013
- CY-AA-130-3010; Dose Equivalent Iodine Determination; Revision 2
- CY-QC-120-503; Reactor Water Iodine Analysis; Revision 2
- CY-QC-110-608; Reactor/Turbine Building Sample Panel Collection; Revision 28
- AR 01481609; Workers Entered Rad Area Without EDs; February 28, 2013
- AR 01488640; Unexpected ED Dose Rate Alarm; March 17, 2013

Section 4OA2

- IR 1549852; 902-8 E7 DG 2 Overload Alarm Did Not Clear Following FC; 8/23/2013
- IR 1548635; U-1 Diesel Generator Field Ground Alarm Received; 8/20/2013
- IR 1549583; U2 EDG PCT Extent of Condition Cable Visual Inspection; 8/22/2013

Section 4OA3

- QCOA 3500-01; Feedwater Temperature Reduction With Main Turbine Online
- IR 1564193; Blown Fuse Caused A Loss of Feedwater Heating
- IR 1521734; CRD HCU Accumulator Installed Bottom O-ring Is Incorrect
- IR 1517963; Received Accumulator Alarm for U2 HCU 34-59
- IR 1518056; HCU 34-59 Alarm on Low Gas Pressure
- WO 971626; Overhaul HCU 34-59 And Valves
- WO 1645250; HCU 34-59 Alarm on Low Gas Pressure
- WO 1088128; Overhaul HCU 18-07 And Valves
- QCAN 901(2)-5 G-2, CRD Accumulator N2 Side Low Pressure or High Water Level

- MA-AA-716-011; Work Execution & Closeout

Section 4OA5

- NUREG 1796; Safety Evaluation Report Related to the License Renewal of the Dresden Nuclear Power Station, Units 2 and 3 and Quad Cities Nuclear Power Station, Units 1 and 2; dated 2004
- QCMPM 4400-11; RHR Service Water Intake Bay Inspection; Revision 10
- Work Order 00576538-01; One-Time Inspect Intake Ice Melt Line (License Renewal); dated May 4, 2009
- Condition Report 01434957; (LR) Scoping Review Required for UHS Discharge Piping; dated November 2, 2012
- ER-AA-5400; Buried Piping and Raw Water Corrosion Program (BPRWCP) Guide; Revision 5
- ER-AA-5400-1001; Raw Water Corrosion Program Guide; Revision 6
- ER-AA-5400-1002; Buried Piping Examination Guide; Revision 4
- ER-AA-5400-1003; Buried Pipe and Raw Water Corrosion Program (BPRWCP) Performance Indicators; Revision 4
- ER-AA-330; Conduct of Inservice Inspection Activities; Revision 9
- Project Number: QDC-32021; Evaluation of Soil Samples from Quad Cities Station; January 16, 2013
- ER-AA-335-1008; Code Acceptance & Recording Criteria for Nondestructive (NDE) Surface Examination; Revision 3
- ER-AA-330-001; Section XI Pressure Testing; Revision 11
- ER-AA-335-015; VT-2 Visual Examination; Revision 13
- Work Order 01379600; RHRSW Suction 3rd Period Static VT@ Test (ISI); February 7, 2012
- SA-AA-117; Excavation, Trenching, and Shoring; Revision 15
- Technical Report AM3117-430701; Long Range Guided Wave Ultrasonic Pipe Screening Results; November 15, 2012
- Technical Report AM1292-344277; Long range Guided Wave Ultrasonic Pipe Screening Results; October 6, 2011
- Second Quarter 2013 Program Health Report Buried Pipe/Raw Water Corrosion Program
- AR 01125488; Deficiency Noted During Buried Pipe FASA; October 12, 2010
- AR 01305424; 2011 NEI 09-14 Buried Pipe Inspection Results; December 21, 2011
- AR 01457784; 2012 NEI 09-14 Buried Pipe Inspection Results; January 2, 2013
- AR 01454042; Generate WO to Inspect Concrete for Buried Pipe Program 2013; December 12, 2012
- AR 01463277; Static Reading for Cathodic Protection (CP) System; January 16, 2013
- AR 011644819; 2010 Cathodic Protection Assessment ID PM Change Needed; January 20, 2011
- Cathodic Protection System Quarterly System Health Report; June 30, 2013
- Evaluation Report No. NUC2012121.00; Condition Assessment Excavated Buried Pipe; October 31, 2012

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
EDG	Emergency Diesel Generator
FSAR	Final Safety Analysis Report
HCU	Hydraulic Control Unit
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
SSC	Systems, Structures, and Components
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
Vdc	Volts Direct Current
WO	Work Order

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

Sincerely,

/RA/

Christine Lipa, Chief
Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000254/2013004 and 05000265/2013004
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Letter to Michael Pacilio from Christine Lipa dated November 4, 2013

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2013004 AND
05000265/2013004

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