UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

July 22, 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 05000254/2013003 AND 05000265/2013003

Dear Mr. Pacilio:

On June 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 inspection report documents the inspection results, which were discussed on July 9, 2013, with Mr. T. Hanley and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

One NRC identified finding and one self-revealing finding of very low safety significance were identified during this inspection. The findings were determined to involve violations of NRC requirements. Further, two licensee-identified violations which were determined to be of very low safety significance are listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; 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 05000254/2013003 and 05000265/2013003
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ™

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254; 50-265
License Nos:	DPR-29, DPR-30
Report No:	05000254/2013003; 05000265/2013003
Licensee:	Exelon Generation Company, LLC
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, IL
Dates:	April 1 through June 30, 2013
Inspectors:	J. McGhee, Senior Resident Inspector B. Cushman, Resident Inspector J. Bozga, Reactor Inspector L. Jones, Engineering Inspector R. Langstaff, Senior Reactor Inspector G. O'Dwyer, Engineering Inspector D. Szwarc, Reactor Inspector S. Bell, Health Physicist C. Mathews, Illinois Emergency Management Agency
Approved by:	Christine Lipa, Chief Branch 1 Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY OF FINDINGS

Inspection Report (IR) 05000254/2013003 and 05000265/2013003; 04/01/13 - 06/30/13; Quad Cities Nuclear Power Station, Units 1 and 2; Heat Sink Performance and 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 self-revealed and one Green finding was identified by inspectors. The findings were considered non-cited violations (NCVs) of NRC regulations. The significance of inspection findings is indicated by their color (i.e., Green, White, Yellow, or 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 and associated non-citied violation (NCV) of 10 CFR Appendix B, Criterion III, "Design Control," was identified by the inspectors for the licensee's failure to translate design requirements into procedures to ensure availability of the ultimate heat sink (UHS) in a loss of lock event. Specifically, the licensee failed to translate the need to minimize diesel generator cooling water (DGCW) flow as assumed in the design calculation into station operating procedures. In response to the inspectors' concerns, the licensee initiated actions to verify the required flow of the DGCW system and assessed operability. Because the existing river temperature was significantly lower than 95°F (the assumed initial temperature), the licensee concluded the UHS was capable of performing its function. This violation was entered into the licensee's corrective action program as issue report 1416634.

The inspectors determined the performance deficiency was more than minor because operating procedures did not require throttling of the DGCW flow or guidance if an emergency diesel generator was operating following a lock failure resulting from a barge colliding into the lock structure. The lack of guidance resulted in an increased heat load and resulted in reasonable doubt the UHS would remain below 108°F. The inspectors evaluated the finding using IMC 0609, Exhibit 4, "External Events Screening Questions," and answered "no" to all of the applicable questions. Subsequent calculations by the licensee indicated the maximum flow would not challenge the maximum design temperature limits for the UHS. Therefore, the finding screened as of very low safety significance (Green). The inspectors determined the cause of this finding did not represent current licensee performance and, thus, no cross-cutting aspect was assigned. (Section 1R07.2.b.(1))

- Green. A self-revealed finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified on March 11, 2013, when all four outboard main steam isolation valves (MSIVs) were stroke timed greater than 5 seconds in the shut direction. Specifically, the allowable range for the as-left stroke time in the surveillance procedure did not ensure that the valve would meet the Technical Specification (TS) acceptance criteria throughout the operating cycle. The licensee entered the issue into the corrective action program as Issue Report 1485944, and corrective actions were taken to adjust the timing of all Unit 1 outboard MSIVs to restore compliance with TS.

This issue was more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern. The inspectors determined the finding screened as having very low safety significance (Green) because the inspectors answered "No" to each of the applicable screening questions located in IMC 0609. The inspectors determined the cause of this finding did not represent current licensee performance and, thus, no cross-cutting aspect was assigned. (Section 4OA2.6)

B. <u>Licensee-Identified Violations</u>

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

REPORT DETAILS

Summary of Plant Status

Unit 1

Unit 1 began the period in a refueling outage. The unit restarted on April 5 and reached full power on April 10, 2013. Unit 1 operated at 100 percent thermal power throughout the remainder of the evaluated period through June 30, 2013, 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 April 1, 2013 through June 5, 2013.

At 10:58 p.m. on June 5, 2013, operators reduced power on Unit 2 to 57 percent reactor power following an electrical transient caused by a raccoon in the switchyard. The raccoon caused a ground fault on T-82, the 13.8 kV transformer located in the 345 kV switchyard. The line protective functions isolated the fault, de-energizing T-82 and the Unit 2 reserve auxiliary transformer (T-22). With this switchyard bus de-energized, power generation in the yard is restricted procedurally by the transmission operator, and plant operators reduced reactor power from 2957 MWth to 2511 MWth in accordance with station procedures. Due to the voltage perturbation on the Unit 2 buses with de-energization of T-22, several feedwater heater level control valves unlatched, resulting in a partial loss of feedwater heating. Operators continued reducing power in response to the loss of feedwater heating and stabilized the unit at 57 percent power. Over the next several hours, the damaged transformer was switched out of service and the switchyard ring bus was restored. Operators restored the unit to 100 percent power at 11:23 a.m. on June 6, 2013. Unit 2 operated at 100 percent thermal power throughout the remainder of the evaluated period ending June 30, 2013, with the exception of a planned power reduction for rod pattern exchange.

REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness of Offsite and Alternate Alternating Current Power Systems

a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communication protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

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

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

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

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

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

b. Findings

No findings were identified.

Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report.

The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Safe shutdown makeup pump heating, ventilation, and air conditioning; and
- Stator water cooling heat exchanger.

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

b. Findings

No findings were identified.

Readiness for Impending Adverse Weather Condition – Severe Thunderstorm Watch

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for June 12, 2013, the inspectors reviewed the licensee's overall preparations/protection for the expected weather conditions. On June 12, 2013, the inspectors walked down the licensee's emergency AC power systems, because their safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Unit 1 reactor core isolation cooling system;
- Unit 1 'A' core spray system;
- Unit 1 station blackout diesel generator; and
- Unit 2 station blackout diesel generator.

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

These activities constituted four partial system walkdown samples as defined in IP 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

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 11.1.1, Unit 1 Turbine Building, Elevation 547'-0", Residual Heat Removal Service Water Pumps;
- Fire Zone 8.2.4, Unit 1 Turbine Building, Elevation 580'-0", Cable Tunnel;

- Fire Zone 8.2.5, Unit 1/2 Turbine Building, Elevation 580'-0", Unit 2 Cable Tunnel;
- Fire Zone Station Blackout Building, Unit 1/2 Station Blackout, Elevation 595'-0", Station Blackout Building; and
- Fire Zone Station Blackout Building, Unit 1/2 Station Blackout, Second Floor Station Blackout Building.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On May 13, 2013, the inspectors observed fire brigade activation for a fire in a turbine building service air compressor. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate fire fighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;

- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection inspection sample as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

Annual Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's inspection of Unit 1 emergency diesel generator (EDG) cooling water heat exchanger to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's inspection findings as compared against acceptance criteria and the frequency of inspection. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions. Documents reviewed for this inspection are listed in the Attachment to this document.

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

b. Findings

No findings were identified.

Triennial Review of Heat Sink Performance (71111.07T)

a. Inspection Scope

The triennial review of the Heat Sink Performance was initiated in September 2012. As documented in NRC Inspection Report 05000254/2012003, 05000265/2012003 (ML12299A483), the inspectors completed their review of the 1B core spray pump room cooler. During subsequent inspections and in-office reviews, the inspectors completed the remainder of the inspection procedure objectives as noted below.

The inspectors verified the performance of ultimate heat sinks (UHS) and safety-related service water systems and their subcomponents such as piping, intake screens, pumps, valves, etc., by tests or other equivalent methods to ensure availability and accessibility to the inplant cooling water systems.

The inspectors reviewed the results of the licensee's inspection of the UHS excavations. The inspectors' review included activities related to the identification of settlement or movement indicating loss of structural integrity and/or capacity. In addition, the inspectors verified the licensee ensured sufficient reservoir capacity by trending and removing debris or sediment buildup in the UHS.

The inspectors performed a system walkdown of the service water intake structure to verify the licensee's assessment on structural integrity and component functionality. The inspectors' review included activities related to the ability of the licensee to ensure proper functioning of traveling screens and strainers, and structural integrity of component mounts. In addition, the inspectors reviewed the licensee's approach ensuring that service water pump bay silt accumulation was monitored, trended, and maintained at an acceptable level, and that water level instruments are functional and routinely monitored. The inspectors also reviewed the licensee's ability to ensure functionality during adverse weather conditions causing low river level.

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

These inspection activities (inspection of the UHS and 1B core spray pump room cooler as previously documented in but not credited in inspection reports 2012004 and 2012005) constituted two heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

(1). Calculation Assumptions Not Translated Into Operating Procedures

Introduction: The inspectors identified a finding of very low safety significance with an associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to translate design requirements for the availability of the UHS into procedures. Specifically, the licensee failed to translate the need to minimize diesel generator cooling water (DGCW) flow as assumed in the design calculation into station operating procedures.

Description: The inspectors reviewed Calculation QDC -3900-M-0692, "Ultimate Heat Sink Temperature Effect on Shutdown Capability," Revision 0 and minor Revision 000A (post power uprate). The purpose of the calculation was to determine the effect of UHS heat up caused by a dual unit shutdown during a loss of downstream lock and dam event. The inspectors noted Design Input 4.19 assumed a minimum DGCW flow rate of 1304 gpm. This minimum flow rate was used because assuming the lock failed due to a barge colliding into the lock structure; the EDGs are not anticipated to be operating during this event. However, the DGCW pumps would be required for emergency core cooling system room cooling.

The calculation showed with an assumed Mississippi River temperature of 95 degrees Fahrenheit (°F), the maximum expected temperature of the crib house intake water will be approximately 108°F. The inspectors noted the Section 9.2.5.3 of the UFSAR stated the maximum temperature of the water was 108°F; therefore, no calculated margin existed. The inspectors also noted QCOA 0010-14, “Lock and Dam 14 Failure,” Revision 10 did not required operators to throttle DGCW flow to this minimum value.

In response to the inspectors’ concerns, the licensee issued AR 01416634, “Ultimate Heat Sink Calculation Uses Minimum Pump Flow Rates,” and initiated actions to verify the required flow of the RHRSW and DGCW flows in calculation QDC -3900-M-0692. The licensee performed a preliminary calculation assuming the maximum DGCW flow and determined the as-calculated crib house intake water temperature would be above 108°F. The licensee assessed operability and determined with river temperature significantly lower than 95°F, the UHS was capable of performing its function.

Subsequently, the licensee performed a more detailed calculation and concluded the UHS remained operable assuming the maximum DGCW flow rate. The licensee planned to update the calculation of record and UFSAR accordingly.

<u>Analysis</u>: The inspectors determined that the failure to translate design criteria for the operability of the Ultimate Heat Sink into procedures was contrary to 10 CFR Part 50, Appendix B Criterion III, “Design Control” and was a performance deficiency. Specifically, Calculation QDC -3900-M-0692 assumed a flow rate which was not translated into the operating procedures. The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of Design Control, and affected the cornerstone objective of ensuring the capability of equipment relying on the UHS. Specifically, based on the calculation of record at the time of discovery, the inspectors had reasonable doubt the UHS would remain below 108°F following a lock failure resulting from a barge colliding into the lock structure since procedures did not require throttling of the DGCW flow or guidance if an EDG was operating during the event.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04,“ “Initial Characterization of Findings.” Because the finding impacted the Mitigating Systems, cornerstone, the inspectors screened the finding through IMC 0609 Appendix A, “The Significance Determination Process for Findings At-Power,” using Exhibit 2, “Mitigating Systems Screening Questions.” The inspectors also evaluated the finding using Exhibit 4, “External Events Screening Questions,” and answered “no” to all of the applicable questions. Subsequent calculations by the licensee indicated the maximum flow would not challenge the maximum design temperature limits for the UHS. Therefore, the finding screened as of very low safety significance (Green).

The inspectors determined the cause of this finding did not represent current licensee performance and, thus, no cross-cutting aspect was assigned.

<u>Enforcement</u>: Title 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Section 9.5.5 of the UFSAR stated the minimum DGCW flow rate of 1304 gpm. Section 9.2.5.3 of the UFSAR stated the maximum temperature of the crib house intake water was 108°F.

Contrary to the above, prior to November 30, 2012, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, Procedure QCOA 0010-14 did not include the requirement to throttle DGCW flow rate to the assumed value in the design calculation, challenging the capability of the ultimate heat sink.

The licensee took the immediate corrective actions described above. Because this violation was of very low safety significance and it was entered into the licensee's CAP as AR 01416634, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000254/2013003-01; 05000265/2013003-01, "Calculation Assumptions Not Translated Into Operating Procedures.")**

(2). Question Concerning Licensing Bases of the Ultimate Heat Sink

Introduction: The inspectors identified an unresolved item (URI) concerning the current licensing bases with respect to failure of Lock and Dam No. 14 on the Mississippi River.

Description: The inspectors reviewed several documents to ascertain the current licensing bases for the UHS. The river serves as a source of raw water for the station as well as one of the heat sinks. The licensee designated the UHS as non-safety related and as described in UFSAR Sections 2.4.4 and 9.2.5.3, the UHS is required if the river can no longer support its functions. The inspectors noted the current UFSAR states the loss of river results from damage to the Lock; however, historical documents state the event promulgates from a loss of Dam No. 14. Specifically:

- Section 2.4 of the Final Safety Analysis Report (FSAR) states, in part, the following:

  "The river level at the station is assumed to drop to elevation 561 feet 0 inches ***if Dam No. 14 were to fail*** [emphasis added]. Elevation 561 feet, 0 inches is the normal river level downstream of Dam 14."

  "The station design includes the feature that at the time that ***Dam 14 fails*** [emphasis added] the only systems requiring the use of river water would be the RHR service water pumps."

  "If in the ***unlikely event the broken dam condition occurs*** [emphasis added], it is necessary to open the gate on the ice melting line to permit the discharged water to return to the intake flume. This procedure permits the use of the water impounded in the intake flume and discharge flume to be used as an evaporative heat sink. This technique will impound 3,960,000 gallons of water. The maximum amount of water required by the system at this stage will be approximately 7000 gpm, which means that without any recirculation, the impounded water will last a minimum of 9.4 hours. It will be necessary to make up water to the intake flume under this condition by portable pumping equipment which will move water from the main river channel to the plant. Pumps capable of pumping 7000 gpm water will be maintained on site and backup pumps available from the local fire stations."

In a letter dated November 6, 1970, to the U.S. Atomic Energy Commission (now NRC), Commonwealth Edison (the licensee) addressed questions regarding the use of portable equipment to move water from the main river channel to the plant under frozen river conditions. In response to Question 2.8, the licensee stated the portable pumps would not be required under these conditions. In addition, the licensee afforded the opportunity to clarify some statements in Section 2.4 of the Final Safety Analysis Report (FSAR). Specifically, the licensee stated the portable pumps would not be needed for makeup under a loss of dam event because the evaporative losses were about 20 gpm, not 7000 gpm as written.

Although not stated in the licensee's response, the inspectors noted the original description in FSAR Section 2.4 did not account for the ice melt line used to recirculate water back to the UHS; hence stating the need for makeup to the closed volume of the UHS. The licensee's clarification (the need for 20 gpm makeup) accurately reflects the actual losses that need to be replenished.

In the safety evaluation dated August 25, 1971, Section 2.3 states, "the facility is also designed to provide an adequate supply of cooling water to the plant by providing a reservoir of about 3.8 million gallons of water in the intake bay so that, even if the river level dropped below a level of 565 feet MSL due to ***an assumed failure of Dam 14 downstream of the site*** [emphasis added], the water trapped in the intake bay would supply an adequate source of water for safe cool-down of the reactor primary system.

In 1989, the licensee determined the original evaporative losses cited in the November 6, 1970, letter did not account for the worst case conditions. The licensee performed a calculation assuming worst case summer conditions and determined the evaporative losses were about 54 gpm. The licensee concluded the two 2000 gpm portable pumps were more than sufficient to address these losses.

In NRC Inspection Report 05000254/1998-201, 05000265/1998-201(ML9805180380), the NRC team identified errors with the 1989 calculation and the licensee's approach. Specifically, the team determined that in an evaporative mode, the trapped volume of UHS would increase in temperature and during summer operation, could be driven well above the 95 degrees Fahrenheit design temperature established for the RHRSW system. The licensee performed a preliminary calculation assuming ***1 hour cool-down time on the main condensers from dam failure to loss of contact with the river*** [emphasis added] and determined the UHS could reach 112 degrees Fahrenheit. The team noted this evaluation used a method of makeup different than the current UFSAR. The team initiated an Unresolved Item 05000254/1998-201-12, 05000265/1998-201-12 to determine the resolution of the dam failure effects on the UHS.

In May 1998, the licensee completed 10 CFR 50.59 Safety Evaluation SE-98-068. The purpose of this evaluation was to assess proposed changes to the UFSAR to incorporate the results of the study and revised temperature calculations. It described the change from "dam failure" to "Lock and Dam failure" as a clarification of the event to include a timeline and credible failure modes for the Lock and Dam. The licensee concluded these changes did not constitute an unreviewed safety question, was not a change to a license condition and did not require a TS change. In May 1998, the licensee revised the UFSAR to reference the study and include details on the expected timeline and actions associated with a transportation accident impacting the Lock.

The revised UFSAR also reiterates the portable pumps are onsite with backup pumps provided from another facility or leasing facility.

In November 1998, an inspection was conducted to follow up on the licensee's actions to address this URI. As documented in NRC Inspection Report 05000254/1998-019, 05000265/1998-019 (ML9812290045), the NRC team noted the licensee performed a hydraulic study of the Mississippi River in April 1998. This study assessed the possible failure modes of Dam No.14 and concluded the most credible and reasonable worst case scenario involved a transportation accident whereby a river barge impacts the Lock and Dam. The study determined the time for the river to separate from the UHS was about 90 hours. The licensee used this information in Calculation QDC-3900-M-0692 to determine the cooling needs for the UHS. The calculation concluded three portable pumps delivering a total of 5100 gpm of cooler water were needed to ensure the inlet temperatures remained within design limits. A violation for the failure to assure the design basis information was consistent with actual plant design was issued.

As described in Section 1R07.1b(3), in April 2001, the licensee completed a 10 CFR 50.59 Safety Evaluation Screening, QC-S-2001-0026, to assess removal of the portable pumps from onsite and relocating the pumps to an offsite leasing facility located a few hours away. The licensee revised the UFSAR and removed the portable pumps from the site.

The inspectors noted the original FSAR did not provide the detail as to the cause of the dam failure or a time line for the loss of river event. The licensee stated their response to Question 2.8, (and as reiterated in the August 1971 Safety Evaluation) implies the loss is not immediate because "water level would recede in the condenser box and the unit would be shutdown due to loss of condenser vacuum." The licensee contends the main condenser would remain functional following a dam failure up until the vacuum can no longer be maintained by the UHS supply. The inspectors noted the licensee had assumed 1-hour of such operation in their preliminary calculation performed in November 1998. The inspectors were concerned the licensee redefined the loss of river event from the original Section 2.4 of the FSAR description of an "unlikely event" of a broken dam to a transportation accident impacting the lock. Therefore, this issue is considered an Unresolved Item **(URI 5000254/2013003-02; 05000265/2013003-02, "Question Concerning Licensing Bases of the Ultimate Heat Sink")** pending further consultation with the Office of Nuclear Reactor Regulation.

(3). <u>Failure to Assess Impact of Relocating Portable Pumps Offsite</u>

<u>Introduction</u>: The inspectors identified an URI concerning the licensee's failure to perform a 10 CFR 50.59 Safety Evaluation for the facility change involving the relocation of the portable pumps used to replenish the UHS.

<u>Description</u>: In April 2001, the licensee completed a 10 CFR 50.59 Safety Evaluation Screening, QC-S-2001-0026, to assess removal of the portable pumps from onsite and relocating the pumps to an offsite leasing facility located a few hours away. The licensee justified the change by stating the pumps were not needed for about 2 days and to reduce costs, were not needed to be maintained on site. The licensee reasoned that leasing pumps would result in more reliable and an increased number of pumps for the event. The licensee implemented UFSAR-99-R6-165 to revise the UFSAR wording regarding the availability of the portable pumps. Specifically, the licensee revised,

"Portable pumps of sufficient capacity are onsite, backup pump(s) would be available from another station or leasing facility" and changed to "Portable pumps of sufficient capacity are available from a leasing facility."

The inspectors noted Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Test, and Experiments," endorsed NEI 96-07 Revision 1, "Guidelines for 10 CFR 50.59 Evaluations." Section 4.2.1 of NEI 96-07 describes how to determine whether an activity was a change to the facility or procedure as described in the UFSAR. The guidance provides a series of questions including "does the activity reduce existing redundancy, diversity, or defense in depth"? In the screening, the licensee stated the proposed change did not have a negative impact, in fact, it was portrayed as a positive impact. The inspectors disagreed. Removing the pumps from on site decreased the existing redundancy, diversity and defense in depth because the site was no longer relying on onsite pumps ***with*** [emphasis added] backup capabilities and now solely relied on the backup pumps. The licensee did not consider the increased likelihood of failure due to (1) potential unavailability from the vendor due to other external events or competing interests; or (2) an accident occurring during transport which may prevent or significantly delay delivery. In addition, the inspectors determined the licensee had not completed or initiated the actions stated in the screening to support the conclusions of no negative impact. Specifically, the licensee stated a predefined would be established to periodically verify the availability of pumps. This predefine was not created. In addition, the licensee stated an actual demonstration including delivery and setup would be accomplished on a routine basis. No such activities were completed.

To address the inspectors' concerns, the licensee initiated AR 01418982, "Godwin Pump Relocation" to perform the 10 CFR 50.59 Safety Evaluation and AR 01416480, "Godwin Pump Performance Not Routinely Checked" to create a periodic surveillance to demonstrate performance of Godwin pumps including the physical delivery of pumps.

As described in Section 1R07.1b.(2), additional information is necessary to determine the assumed failure mechanism of Lock and Dam No. 14. This will result in a determination of whether the portable pumps were required to remain onsite or be relocated. Therefore, this issue is considered an Unresolved Item **(URI 5000254/2013003-03; 05000265/2013003-03, "Failure to Assess Impact of Relocating Portable Pumps Offsite")** pending further consultation with the Office of Nuclear Reactor Regulation.

(4). Question Concerning Availability of Dam Following a Seismic Event

Introduction: The inspectors identified an unresolved item (URI) concerning the assumed availability of Lock and Dam No.14 following a design bases earthquake event.

Description: In a letter dated November 6, 1970 to the U.S. Atomic Energy Commission (now NRC), Commonwealth Edison (the licensee) addressed questions regarding the capability of the intake flume to withstand a seismic event. Specifically, the question stated:

"Demonstrate that the intake flume for plant cooling water either meets the seismic design requirements for a Class I structure or cannot fail in such a manner as to isolate the plant from the **river cooling water source** [emphasis added] in the event of a design basis earthquake."

In response to Question 2.7, the licensee stated the retaining wall structure would remain intact during an operational bases earthquake and design bases earthquake. In addition, the licensee stated the earth embankment was found capable of resisting the sliding effects during a DBE. Lastly, the licensee stated the crib house would not fail and isolate the plant from the river water source.

The design basis earthquake (DBE) at Quad Cities is 0.24g maximum horizontal ground acceleration coupled with other appropriate loadings to provide for containment and safe shutdown. The operating basis earthquake (OBE) is 0.12 g maximum horizontal ground acceleration.

In 1998, the licensee contracted Ashton Engineering to determine the failure modes of Lock and Dam No. 14. In April 1998, Ashton Engineering provided the licensee with its conclusions, as documented in "Study of Mississippi River Water Stage at Quad Cities Nuclear Power Station for Commonwealth Edison Company." The report cites the dam is located in Uniform Building Code (UBC) Seismic Zone 0 and therefore, design guidelines for the dam do not require evaluation for postulated earthquake loadings. The report does conclude the most likely damage during a seismic event would be a loss of the dam gate operating capability; however, the magnitude of the seismic event is not cited.

Question 2.7 implies the river is considered available during a DBE event even though the downstream dam is not designed or constructed to remain functional during the assumed DBE. Although the site appears to be within their licensing bases (assume availability of the river during a DBE), the inspectors questioned whether this assumption considered actual potential consequences, i.e., the need to assume a loss of dam during a seismic event. This concern is considered an Unresolved Item **(URI 5000254/2013003-04; 05000265/2013003-04, "Question Concerning Availability of Dam Following a Seismic Event.")** pending further consultation with the Office of Nuclear Reactor Regulation.

1R11 Licensed Operator Requalification Program (71111.11)

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

a. Inspection Scope

On June 17, 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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On April 5, 2013, the inspectors observed the approach to criticality during startup from a refueling outage on Unit 1. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas:

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

The performance in these areas was compared to pre-established operator action expectations, procedural compliance, and task completion requirements.

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)

Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- Z5790: Emergency Diesel Generator Room Ventilation; and
- Z3900: Service Water/Diesel Generator Cooling Water.

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 reclassification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two 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)

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 13-15-04 (Unit 1 plant startup, Unit 1 automatic depressurization system logic testing, Unit 1 125 Vdc battery modified service test, safe shutdown makeup pump room cooler maintenance);
- Work Week 13-18-07 (Unit 1 125 Vdc battery charger, 1A low pressure coolant injection and containment cooling logic test, low pressure coolant injection time delay relay test, 345 kV switchyard work enabling Unit 2 trip logic); and
- Work Week 13-21-10 (1B residual heat removal (RHR) loop, 1C RHR pump seal cooler, Unit 1 EDG and EDG heat exchanger inspection, stopples in Unit 1 EDG cooling water pump, 1B residual heat removal service water pump and extended out of service, 2B turbine building component cooling water heat exchanger inspection, and 345 kV switchyard breaker 3-4 out of service).

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.

Specific documents reviewed during this inspection are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted three samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

Issue Report (IR) 01506966: Incorrect Tubing Installed on 1C RHR Pump Seal Cooler;
IR 01523351: Unit 1 EDG Fuel Oil Water Analysis Is Above 0.05 percent Limit;
IR 01509801: MK506 Penetration Leakage High; and
IR 01525997: Open Light Did Not Illuminate on Vacuum Breaker.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee’s evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

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

a. Findings

A licensee-identified violation associated with IR 01506966 is discussed in Section 4OA7 of this report. No other findings were identified.

1R18 Plant Modifications (71111.18)

Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification(s):

- Engineering Change (EC) 371545: Unit 1 High Pressure Scram Setpoint Change; and
- EC 390476: Install Load Reject Circuit.

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

This inspection constituted two permanent plant modification samples as defined in IP 71111.18-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

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 2300-27, Revision 29: HPCI [high pressure coolant injection] Pump Comprehensive/Performance Test; and
- WO 1641260: Unit 1 HCU [hydraulic control unit] 34-03 Accumulator Replacement.

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, and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R20 Outage Activities (71111.20)

Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the Shutdown Safety Management Plan (SSMP) and contingency plans for the Unit 1 refueling outage (RFO), conducted March 11 - April 5, 2013, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the SSMP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- controls over the status and configuration of electrical systems to ensure that TS and SSMP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- licensee fatigue management, as required by 10 CFR 26, Subpart I;
- refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing; and
- licensee identification and resolution of problems related to RFO activities.

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

This inspection was continued from the first quarter 2013 reporting period documented in NRC Inspection Report 05000254/2013002, 05000265/2013002. This inspection constituted one RFO sample as defined in IP 71111.20-05.

b. <u>Findings</u>

No findings were identified.

.1 <u>Other Outage Activities</u>

a. <u>Inspection Scope</u>

From May 6 - 24, 2013, the inspectors reviewed the licensee’s Control of Heavy Loads Program in conjunction with the NRC’s Operating Experience Smart Sample (OpESS) FY2007–03, Revision 2, “Crane and Heavy Lift Inspection, Supplemental Guidance for Inspection Procedure (IP) 71111.20,” specifically related to the removal and installation of the reactor vessel head during refueling outages. The inspectors performed the following activities listed below during the inspection. Documents reviewed during the inspection are listed in the Attachment to this report.

- Reviewed the licensee’s reactor building crane preventative maintenance program procedures. Also, reviewed a sample of licensee records of reactor building crane inspections completed prior to reactor disassembly and reactor head lift.

- Reviewed a sample of licensee records of reactor pressure vessel head strongback and steam dryer and steam separator lifting device inspections completed prior to reactor disassembly and reactor head lift.
- Reviewed the licensee's submittals and commitments related to Generic Letters 80-113 and 81-07, "Control of Heavy Loads."
- Reviewed documents supporting the licensee's classification of the reactor building crane as single failure proof.
- Reviewed a sample of licensee's design calculations of rigging and special lifting devices used to remove and install the reactor vessel head during refueling operations.
- Reviewed a sample of licensee's procedures that control reactor vessel safe load path to remove and install the reactor vessel head during refueling operations.
- Reviewed the licensee's preventative maintenance, inspection, and testing program procedures of rigging and special lifting devices used to remove and install the reactor vessel head during refueling operations.

b. Findings

Introduction: The inspectors determined that an unresolved item (URI) existed concerning the fracture toughness properties of the steam dryer/steam separator lifting device.

Description: The safety evaluation report for the Control of Heavy Loads Phase 1 at Quad Cities Units 1 and 2, dated June 27, 1983, classified the steam dryer/steam separator lifting device as a special lifting device and provided documentation how compliance with ANSI N14.6-1978, "Standard for Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or more for Nuclear Materials," was met. The inspectors reviewed Calculation No. 487-002Ca, "Steam Dryer/Steam Separator Lifting Device Calculation," Revision 1, that was used to demonstrate compliance with ANSI N14.6.

> ANSI N14.6-1978, Section 3.2.1.1 states in part, "…When materials that have yield strengths above 80 percent of their ultimate strength are used, each case requires special consideration, and the foregoing stress design factors do not apply. Design shall be on the basis of the material's fracture toughness, and the designer shall establish the criteria…" The inspectors identified in Calculation No. 487-002Ca that the socket pin, hook pin, and lock pin of the steam dryer/steam separator lifting device had yield strengths greater than 80 percent of their ultimate strengths. During the time of the inspection, Calculation No.487-002Ca did not contain an evaluation of these structural elements based on their fracture toughness properties and did not contain a brittle fracture analysis.

In response to this concern, the licensee initiated IR 1517114, "Dryer/Separator Strongback Calculation Discrepancies," dated May 23, 2013, to address this concern. During the time of the inspection, the license was not able to locate information with respect to the fracture toughness properties of the hook pin, socket pin, and lock pin. The licensee is investigating the lifting device further with the vendor of the lifting device and plans to provide additional information on the fracture toughness properties and determine a factor of safety against brittle fracture of the lock pin, socket pin, and hook pin, which will require additional inspector review. Therefore, this issue is considered an unresolved item **(URI 05000254/2013003-05; 05000265/2013003-05, "Steam Dryer/Steam Separator Lifting Device Fracture Toughness Properties")**, pending additional inspector review.

1R22 Surveillance Testing (71111.22)

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 1400-01: Quarterly Core Spray System Flow Rate Test partial for 2A Core Spray (IST);
- QCOS 1600-07: Reactor Coolant Leakage in the Drywell (RCS); and
- QCOS 7500-08: Unit 2 Standby Gas Treatment Initiation and Reactor Building Ventilation Isolation 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 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;
- testing for inservice testing activities 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, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;

- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on April 30, 2013, and again on May 9, 2013, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the control room simulator and Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This emergency preparedness drill inspection constituted two samples as defined in IP 71114.06-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

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

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

Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the solid radioactive waste system description in the FSAR, the Process Control Program, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed.

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

b. Findings

No findings were identified.

Radioactive Material Storage (02.02)

a. Inspection Scope

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

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

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

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

b. Findings

No findings were identified.

Radioactive Waste System Walkdown (02.03)

a. Inspection Scope

The inspectors walked down accessible portions of select radioactive waste processing systems to assess whether the current system configuration and operation agreed with the descriptions in the FSAR, Offsite Dose Calculation Manual, and process control program.

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

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

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

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

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

b. Findings

No findings were identified.

Waste Characterization and Classification (02.04)

a. Inspection Scope

The inspectors selected the following radioactive waste streams for review:

- Dry Active Waste; March 2012;
- Reactor Water Cleanup Resin; March 2012; and
- Reactor Particulate; February 2012.

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

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

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

b. Findings

No findings were identified.

Shipment Preparation (02.05)

a. Inspection Scope

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

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

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

Due to limited opportunities for direct observation, the inspectors reviewed the technical instructions presented to workers during routine training. The inspectors assessed whether the licensee's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

b. Findings

No findings were identified.

Shipping Records (02.06)

a. Inspection Scope

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

- QC-12-026; Radioactive Waste Shipment; Spent Resin;
- QC-12-027; Radioactive Waste Shipment Reactor Water Cleanup Resin;
- QC-12-123; Radioactive Waste Shipment – Recirculation Pump Impeller;
- QC-13-050; Radioactive Waste Shipment of Filters and Miscellaneous Materials; and
- QC-13-343; Radioactive Material Shipment – Outage Equipment.

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

b. Findings

No findings were identified.

Identification and Resolution of Problems (02.07)

a. Inspection Scope

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

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

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance indicator for Quad Cities Unit 1 and Unit 2 for the period from April 1, 2012, through March 31, 2013. To determine the accuracy of the performance indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, were used. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports and NRC integrated inspection reports for the period of April 1, 2012 through March 31, 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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

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.

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.

Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of December 1, 2012 through June 1, 2013, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major equipment problem lists, maintenance rework lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

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

b. Findings

No findings were identified.

Selected Issue Follow-up Inspection: IR 1500819, Poor Wiring Connections Identified During QCOS 0203-08

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting degraded electrical connections associated with the 'B' and 'C' electromatic relief valves (ERVs) in the automatic depressurization system. On April 11, 2013, electrical maintenance technicians supporting the operation department perform QCOS 0203-08, "Unit 1 Online Automatic Blowdown Logic Test," when the electricians identified two electrical connections that did not appear to be correct. The electrical leads were visually determined to not be properly compressed at their termination points within the control cabinet by electricians supporting a TS surveillance test of the associated logic. One wire was not captured by the compression fitting and a second had only one strand of the seven-strand wire captured by a compression fitting. The licensee initially determined that the as-found configuration could have prevented the valves from actuating under design basis conditions and reported the issue as Event Notice 48916 under 50.72(b)(3)(v)(D) as an event or condition that could have prevented the fulfillment of a safety function. The wiring for both valves was repaired and operability restored 4 hours and 40 minutes after they were initially declared inoperable.

During the repair the licensee identified that the orange wire for the 'B' ERV (1-0203-3B) at terminal AA-30 was resting against the connector, but was not held in place under the terminal board compression fitting. The resistance across the connection was measured at 30 ohms when it was expected to be less than 1 ohm. While the increased resistance did not impact electrical performance of the circuit as demonstrated by operation of the circuitry during surveillance testing and continuity checks prior to repair, the lack of a secure connection impacted reliability. The licensee determined that the termination had never been properly installed due to the compression fitting being found tight on a smaller wire connected at the same terminal connection.

The connection for the 'C' ERV (1-0203-3C) was found to have an electrical resistance <1 ohm as expected. The non-conforming connection (only one strand of the multi-strand wire captured in the compression fitting) was attributed to poor craftsmanship at the time of its last termination. The licensee's investigation determined that no work had been documented on these terminal points since initial installation.

The licensee performed an evaluation of the circuit integrity for both connections. The evaluations were documented in EC 393465, "Review of Wiring Connections on Unit 1 ERVs in 102201-32 for Seismic Loads," and EC 393475, "ERV Function with Degraded Terminations as Described in IR 01500819." The evaluations concluded that the functions of the 1-0203-3B and 1-0203-3C were supported despite the degraded terminations. In the case of the 1-0203-3B ERV, the wire that was not landed was determined to be one of three parallel cables, and the change in overall circuit resistance was found to be well within the margin of the existing calculation. Additionally, movement of the cabling was restricted by cable routing and the terminal connections on either side of the wire were part of this parallel connection such that inadvertent contact due seismic activity would not have caused a degraded electrical condition. In the case of the 1-0203-3C connection, the single strand still connected passed a tug test and was verified to have been able to pass circuit current without degradation.

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

b. Findings

A licensee-identified finding is discussed in Section 4OA7.2 of this report. No additional findings were identified.

Selected Issue Follow-up Inspection: IR 1521898 Unexpected Loss of Transformer 22

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting the loss of Transformers 22 and 82 during the evening of June 5, 2013. The electrical transient was caused by an animal causing a short on Transformer 82. Protective relaying isolated the fault by opening breakers around Transformer 82 by design. This also caused a loss of power to Transformer 22, which supplies one qualified line of offsite power to both operating units per TS. The licensee entered the appropriate abnormal procedures to reduce power on Unit 2 to 2511 MWth about 85 percent reactor power in response to a loss of Transformer 22.

An additional result of the electrical transient was the unlatching of several feedwater heater level control valves on Unit 2 resulting in a partial loss of feedwater heating. The licensee entered their procedure for reduced feedwater temperature with the main turbine online and continued the downpower past 2511 MWth to 1768 MWth about 60 percent reactor power. With plant conditions stable, the licensee recovered feedwater heating, reclosed the switchyard ring bus, and began power ascension. Unit 2 was returned to full power and a normal electrical lineup was restored during the morning of June 6, 2013.

The inspectors reviewed operator actions and the use of abnormal procedures and found that the procedures used were appropriate to the circumstances and applicable TS requirements were implemented as required. Appropriate testing of components was performed prior to equipment restoration.

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

b. Findings

No findings were identified.

Selected Issue Follow-up Inspection: IR 1485944 – Unit 1 Main Steam Isolation Valves Failed to Close Within Technical Specification Closure Time Criteria

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting the slow closure of the Unit 1 main steam isolation valves (MSIVs) discovered during the Unit 1 2013 refueling outage.

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

b. Findings

Introduction: A self-revealing finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," were identified on March 11, 2013, when all four outboard MSIVs were stroke timed in the shut direction greater than 5 seconds.

Discussion: On March 11, 2013, during the Unit 1 refueling outage, the licensee was performing QCOS 0250-04, "MSIV Closure Timing." This procedure was used to meet the TS Surveillance Requirement 3.6.1.3.6 (i.e., Verify the isolation time of each MSIV is greater than or equal to 3 seconds and less than or equal to 5 seconds.) During the performance of this surveillance, all four outboard MSIVs were timed greater than 5 seconds, failing the TS surveillance. This condition not allowed by TS was reported to the NRC with LER 2013-002-00. Even though the TS requirements were exceeded, the assumptions in the design basis accident calculations and the offsite dose calculation manual of 10 seconds were not exceeded. Therefore, the licensee remained within their design basis at all times.

Review of the as-left timing recorded in June 2011 for the four outboard MSIVs were close to the acceptance criteria of 5 seconds. This was evaluated as acceptable in QCOS 0250-04 due to the value specified in the procedure requiring timing adjustment. According to the procedure, the timing did not need adjustment unless it was greater than or equal to 4.9 seconds. The historical trending for MSIVs on both units shows that the recorded timing from the as-found to the previous as-left could be reasonably expected to vary by half a second in the slow or fast direction. Inspectors determined that the as-left tolerance value was not conservative given the operating history of the valve and did not ensure that the TS limits would be satisfied throughout the cycle.

Analysis: The inspectors determined that the surveillance procedure that allowed as-left values, when added to expected drift, to exceed the acceptance criteria was a performance deficiency since the procedure would not ensure operability of the valves for the cycle. This issue was more than minor because if left uncorrected it would have the potential to lead to a more significant safety concern.

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 all questions of Exhibit 2, "Mitigating Systems Screening Questions," Section A - Mitigating SSCs and Functionality (Except

Reactivity Control Systems),"No," and therefore, the finding screened as Green or very low safety significance.

The inspectors did not identify a cross-cutting aspect for this performance deficiency. QCOS 0250-04 has been in use for several years with no major revisions. Therefore, this has been determined to be a legacy issue and not reflective of current performance.

Enforcement: Title 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states in part activities affecting quality shall be prescribed by procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Technical Specification Surveillance Requirement Procedure 3.6.1.3.6 required in part that the licensee verify the isolation time of each MSIV is less than or equal to 5 seconds.

Contrary to the above, on June 6, 2011, QCOS 0250-04 was used to satisfy the TS surveillance requirement to verify the MSIV isolation time is within the requirements of TS and was not appropriate to the circumstances in that the procedure allowed the licensee to leave the MSIV as-left closure times near the acceptance criteria without consideration for expected drift over the course of the operating cycle. This condition did not result in the reasonable assurance of compliance with TS throughout the duration of the operating cycle. Because this violation was of very low safety significance and it was entered into the licensee's CAP as IR 1485944, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000254/2013003-06, "Unit 1 MSIV Slow Closure").** Immediate corrective actions were to adjust the timing of all Unit 1 outboard MSIVs. Additional corrective actions include changes to the MSIV timing procedure to establish an appropriate as-left band for the MSIVs.

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

(Closed) Licensee Event Report (LER) 05000254/2013-001-00: Emergency Diesel Generator Cooling Water System Not Aligned

On March 1, 2013, the Unit 1/2 diesel generator cooling water pump was discovered to be aligned to the wrong unit. A human performance error during initial alignment of the system to supply cooling water to the Unit 1 emergency core cooling system room coolers on February 28, 2013, when the Unit 1 diesel generator cooling water pump was inoperable and not capable of providing cooling. The root cause investigation determined that the operators failed to use the human performance tools of self-checking, peer checking, and procedure use/adherence during the activity due to over-confidence and complacency. The misalignment was discovered during system realignment to the normal configuration and documented in the licensee's CAP program as IR 01482214. The system realignment was completed and verified to be correct. The licensee's corrective actions included removal of the operators' qualifications, increased oversight of operations department activities, and implementation of a focused intervention plan using the licensee's behavioral observation plan to ensure departmental human performance standards are implemented correctly.

A finding with an associated NCV was included in Quad Cities Units 1 and 2 NRC Integrated Report 05000254/2013002; 05000265/2013002 issued on May 3, 2013, for the failure to follow procedure. In addition, a cross-cutting aspect was assigned in the area of Human Performance - Work Practices because the licensee personnel did not use human performance tools and techniques to ensure proper execution of the task. No additional findings were identified during the followup review of the LER. Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

(Closed) Licensee Event Report (LER) 05000254/2013-002-00: Outboard Main Steam Isolation Valves Stroke Times Exceeded for Quad Cities Nuclear Power Station, Unit 1

This event, which occurred on March 11, 2013, when all four outboard MSIVs were stroke timed in the shut direction greater than 5 seconds. This issue and associated NCV are discussed in 4OA2.6 of this report. Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

.2 (Closed) Licensee Event Report (LER) 05000254/2013-003-00: Reactor Head Vent Piping Pressure Boundary Leakage

This event occurred on March 26, 2013, while Unit 1 was shut down for a refueling outage. Leakage was identified on the 2 inch reactor vessel head vent piping during a reactor pressure vessel (RPV) pressure test. The leakage rate was approximately 20 drops per minute. The leakage was from a socket weld between the pipe and a 90 degree fitting. The RPV pressure test was stopped and the reactor vessel depressurized to allow additional inspections and necessary repairs.

Inspectors reviewed containment atmospheric parameters and unidentified leakage during the cycle to determine if the leakage existed prior to the pressure test, but found no indication that condition existed in Modes 1, 2, or 3. Corrective actions for the leak included repairing the weld by removal of the existing weld material and applications of a new weld. Future corrective actions include inspection other similar RPV head vent welds and performing repairs as necessary. Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

4OA6 Management Meetings

Exit Meeting Summary

On July 9, 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 none of the potential report input discussed was considered proprietary.

Interim Exit Meetings

Interim exits were conducted for:

- The inspection results for the area of radioactive solid waste processing and radioactive material handling, storage, and transportation with Mr. S. Darin, Plant Manager, on June 21, 2013.
- The inspection results for the area of radioactive solid waste processing and radioactive material handling, storage, and transportation (teleconference) with Mr. S. Darin, Plant Manager, on July 2, 2013.
- On May 24, 2013, the inspector presented the crane and heavy lift inspection results to the Mr. S. Darin, Plant Manager, and other members of the licensee's staff. The licensee personnel acknowledged the inspection results inspected. The inspector asked the licensee whether any materials examined during the inspection are considered proprietary. It was agreed that all paper copies of these proprietary documents would be shredded, and all electronic files of these proprietary documents would be deleted.
- The results of the UHS inspection were presented on July 3, 2013, to Mr. S. Darin and other members of the licensee staff.

Except as noted above, the inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

1. Title 10 CFR 50, Appendix B, Criterion IV, "Procurement Document Control" states, in part, that measures shall be established to assure that design basis and other requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services. Contrary to the above, the engineering change materials lists used by procurement to order materials for modification of the 1A and 1C RHR pump seal coolers were not updated to include the design requirements. Issue Report 01506966, "Incorrect Tubing Installed on 1C RHR Pump seal Cooler," documented that the wrong material was ordered for installation of the modification of both pumps and had actually been installed on the 1A pump before the condition was identified. The design specified type 304 stainless steel tubing with a wall thickness of 0.65 inches and after an informal communication between the design engineer and the procurement specialist, type 316 stainless steel tubing with a wall thickness of 0.49 inches was ordered and subsequently installed on the 1A pump. The issue was more than minor because the performance deficiency, if left uncorrected, could be reasonably viewed as a precursor to a more significant event. Specifically, failure to update materials list with appropriate design basis information could result in installation of parts that reduce reliability or cause a loss of equipment operability or safety function. In this instance, the licensee determined that the non-conforming condition of the 1A RHR did not impact operability of the pump and inspectors agreed that the required functions were still satisfied. An engineering

evaluation determined that the installed material was acceptable in the application and the plant documentation was appropriately updated to reflect the new material. Inspectors answered screening question A.1 of Manual Chapter 0609, Appendix A, Exhibit 2 “Yes” since no loss of function occurred and the issue screened as Green.

2. Title 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings” states, in part, that activities affecting quality shall be prescribed by documented drawings and shall be accomplished in accordance with drawings. Electrical Drawing 4E-1461, “Schematic Diagram Auto Blowdown Part I,” identified the wire in question and indicated that the wire was terminated AA-30. Contrary to the above, the wire was not terminated and previous licensee inspections had not identified the discrepancy. The issue was more than minor because the performance deficiency, if left uncorrected, could be reasonably viewed as a precursor to a more significant event. Specifically, a wire that was not terminated correctly could impair the electrical function of the circuit or the power supply for a required safety function. In this instance, the wire was one of three parallel connections, circuit evaluation indicated that the circuit would perform electrically if this wire had no connectivity, and the wire itself was held in a constrained in a way that would not allow grounding. The wiring for both valves was repaired and operability restored 4 hours and 40 minutes after they were initially declared inoperable. Inspectors answered screening question A.1 of Manual Chapter 0609, Appendix A, Exhibit 2 “Yes” since no loss of function occurred and the issue screened as Green.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Hanley, Site Vice President
C. Alguire, System Engineering Manager
J. Colgan, Chemistry Supervisor
D. Luebbe, Work Control Manager
A. Misak, Deputy Maintenance Director
K. O'Shea, Operations Director
T. Petersen, Regulatory Assurance Lead
S. Piepenbrink, Security Manager
T. Wojcik, NOS Manager

Nuclear Regulatory Commission

C. Lipa, Chief, Reactor Projects Branch 1
R. Elliott, Reactor Engineer

Illinois Emergency Management Agency (IEMA)

C. Settles, IEMA

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000254/2013003-01; 05000265/2013003-01	NCV	Calculation Assumptions not Translated into Operating Procedures (Section 1R07.2.b.(1))
05000254/2013003-02; 05000265/2013003-02	URI	Question Concerning Licensing Bases of the Ultimate Heat Sink (Section 1R07.2.b.(2))
05000254/2013003-03; 05000265/2013003-03	URI	Failure to Assess Impact of Relocating Portable Pumps Offsite (Section 1R07.2.b.(3))
05000254/2013003-04; 05000265/2013003-04	URI	Question Concerning Availability of Dam Following a Seismic Event (Section 1R07.2.b.(4))
05000254/2013003-05; 05000265/2013003-05	URI	Steam Dryer/Steam Separator Lifting Device Fracture Toughness Properties (Section 1R20.2)
05000254/2013003-06	NCV	Unit 1 MSIV Slow Closure (Section 4OA2.6)

Closed

05000254/2013003-01; 05000265/2013003-01	NCV	Calculation Assumptions not Translated into Operating Procedures (Section 1R07.2.b.(1))
05000254/2013003-06	NCV	Unit 1 MSIV Slow Closure (Section 4OA2.6)
05000254/2013-001-00	LER	Emergency Diesel Generator Cooling Water System Not Aligned (Section 4OA3.1)
05000254/2013-002-00	LER	Outboard MSIVs Stroke Times Exceeded for Quad Cities Nuclear Power Station, Unit 1 (Section 4OA3.2)
05000254/2013-003-00	LER	Reactor Head Vent Piping Pressure Boundary Leakage (Section 4OA3.3)

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

- OP-AA-108-107-1002, Revision 7; Interface Procedure Between Com E/PECO and Exelon Generation (Nuclear/Power) for Transmission Operations
- Quad Cities NOS Readiness Assessment Report Summer Readiness Preparations Management Directed Assessment MOSMDA-QC-13-08 dated March 18, 2013
- WO #1609739; TXV Valves of the SSMP Room Cooler Needs to be Replaced
- WO #1531798; 1A Stator Water HX Divider Plate Degradation Due to Corrosion
- QCOA 0010-10; Tornado Watch-Warning, Severe Thunderstorm Warning or Severe Winds; Revision 25

Section 1R04

- QOM 1-1300-02; Unit 1 RCIC Valve Checklist; Revision 10
- QOM 1-1400-09; Unit 1 A Core Spray Valve Checklist; Revision 6
- QCOP 6620-05; SBO DG 1(2) Preparation for Standby Readiness; Revision 15
- QOM 1-6620-03; SBO DG 1 Fuel Oil Checklist; Revision 2
- QOM 2-6620-03; SBO DG 2 Fuel Oil Checklist; Revision 2
- QOM 1-6620-02; SBO 1 Jacket Water Valve Checklist; Revision 4
- QOM 2-6620-02; SBO 2 Jacket Water Valve Checklist; Revision 4
- QOM 1-6620-01; SBO DG 1 Starting Air Valve Checklist; Revision 4
- QOM 2-6620-01; SBO DG 2 Starting Air Valve Checklist; Revision 4
- QOM 1-6620-04; SBO DG 1 Lube Oil Valve Checklist; Revision 2
- QOM 2-6620-04; SBO DG 2 Lube Oil Valve Checklist; Revision 2

Section 1R05

- Pre-Fire Plan FZ 11.1.1; Unit 1 TB 547’-0” Elev. RHR Service Water Pumps
- Pre-Fire Plan FZ 8.2.4; Unit 1 TB 580’-0” Elev. Cable Tunnel
- Pre-Fire Plan FZ 8.2.5; Unit ½ TB 580’-0” Elev. U-2 Cable Tunnel
- Pre-Fire Plan FZ 8.2.6.C, 8.2.6.B, 8.2.7.B, 8.2.6.D, 8.2.7.D; Unit 1/2 TB 595'-0" Elev. Unit 1 & 2 Pull Spaces, Oil Storage, Condensate Demin Holding Pumps
- Pre-Fire Plan FZ Station Blackout Building; Unit 1/2 SBO 595'-0" Elev. Station Blackout Building
- Pre-Fire Plan FZ Station Blackout Building; Unit 1/2 SBO 2nd Floor Station Blackout Building

Section 1R07

- QCMMS 6600-07; Emergency Diesel Generator Heat Exchanger Service Water Side Clean and Inspect; Revision 01

Section 1R11

- QCGP 1-1; Normal Unit 1 Startup TIC 3134; Revision 92A

Section 1R12

- Enterprise Maintenance Rule Production Database for the following systems:

  - Z5790; Emergency Diesel Generator Room Ventilation
  - Z3900; Service Water/Diesel Generator Cooling Water

Section 1R13

- Work Week Safety Profile 13-15-04
- Work Week Safety Profile 13-18-07
- Work Week Safety Profile 13-21-10

Section 1R15

- IR 01506966; Incorrect Tubing Installed on 1C RHR Pump Seal Cooler
- EC 378152; Replace the 1A and 1C RHR Pump Seal Coolers
- WO 1395471; Replace the 1A RHR Pump Seal Cooler per 378152
- IR 01509801; MK506 Penetration Leakage High
- WO 1488775; 1A RHRSW Vault Penetrations Test (Flood Protection)
- QCTS 0820-01, Revision 9; Leak Test of the RHR Service Water Vault Flood Protection Penetrations
- QCTP 0130-14; Evaluation of RHRSW Vault Flood Protection Leakage Test Results
- UFSAR Section 3.4.1.2; Internal Flood Protection Measures
- IR 01523351; U-1 EDG Fuel Oil Water Analysis Is Above 0.05% Limit; 6/10/2013
- IR 01525997; Open Light Did Not Illuminate on Vacuum Breaker
- Technical Specification 3.6.1.8,"Suppression Chamber-to-Drywell Vacuum Breakers," and associated Bases
- WO 01636752; Inspect/Repair 1-1601-33B
- EC 370695; Clarify That a Single Functional Drywell –Torus Vacuum Breaker Position Indication Division (1 or 2) Satisfies Surveillance Test Criteria

Section 1R18

- EC 390476; Install "Load Reject" Circuit
- WO 1572389; Install "Load Reject" Circuit per EC 390476
- EC 3711545; Unit 1 High Pressure Scram Setpoint Change

Section 1R19

- WO 1447702-01; HPCI Turbine/Pump, Reservoir Oil Sample, Lube, & Inspection
- WO 008808894; HPCI Turbine Overhaul
- QCMPM 2300-01, Revision 11; HPCI Refuel Preventative Maintenance
- QCOS 2300-27, Revision 29; HPCI Pump Comprehensive/Performance Test
- WO 1545633; Q1R22 PMT's Not Required for Startup
- IR 1519203; U1 HCU 34-03 Accumulator Alarm – Low N2 Pressure; 5/30/2013
- WO 1641260; HCU 1-0300-34-03 Has Leak in Fitting for N2 Cap

Section 1R20

Crane and Heavy Lift Inspection (OpESS FY2007–03)
- ANSI N14.6-1978; Standard for Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials; 1978
- Abel (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated May 15, 1981
- Calculation No. 487-002Ca; Steam Dryer/Steam Separator Lifting Device Calculation; Revision 1
- Drawing No. 2990; Reactor Head Strongback Units 1 and 2; dated December 21, 1977
- Drawing No. 234C6301; Separator Strongback; Revision 1; Sheet 1 of 2
- Drawing No. 234C6301; Separator Strongback; Revision 1; Sheet 2 of 2
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG 0612); dated June 22, 1981
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated September 22, 1981
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated December 11, 1981
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated May 4, 1982
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated May 17, 1982
- Swartz (Commonwealth Edison) Letter to Eisenhut (NRC); Control of Heavy Loads (NUREG-0612); dated November 18, 1982
- Swartz (Commonwealth Edison) Letter to Denton (NRC); Control of Heavy Loads (NUREG-612); dated April 15, 1983
- Exelon Letter to U.S. NRC; Request for License Amendment Related to Heavy Load Handling; dated October 1, 2002
- Exelon Letter to U.S. NRC; Additional Information Regarding Request for License Amendment Related to Heavy Load Handling; dated October 23, 2002
- EC 393737; Evaluation of Strongbacks for the Reactor Head, Drywell Head, Steam Dryer and Steam Separator; Revision 0
- Load Test Report of Quad Cities Units 1 and 2 Dryer/Separator Strongback 124D1216G001; Revision 0
- Procedure No. QCEPM 0700-08; Reactor Building Overhead Crane Annual Inspection; Revision 12
- Procedure No. QCGM 0303-01; Crane Operator Daily Visual Crane Inspection; Revision 10
- Procedure No. QCMM 5800-13; Movement of Refuel Floor Equipment in Restricted Areas; Revision 5
- Procedure No. QCMPM 5800-01; Annual Crane Inspection and Preventative Maintenance Inspection; Revision 11
- Procedure No. QCMPM 5800-02; Periodic Inspection and Preventative Maintenance Program for Overhead Cranes, Jib Cranes and Monorail Systems; Revision 48
- Procedure No. MA-AB-756-600; Reactor Disassembly; Revision 18
- Procedure No. MA-AB-756-601; Reactor Reassembly; Revision 19
- Procedure No. MA-AA-716-021; Rigging and Lifting Program; Revision 20
- Procedure No. MA-AA-716-022; Control of Heavy Loads Program; Revision 11
- Procedure No. QCMPM 5800-31; Lifting Rig Pin Surveillance and Non-Destructive Examination; Revision 9
- Procedure No. QCMPM 5800-32; Inspection of Slings; Revision 9

- NRC Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Approval to Facility Modifications to Reduce the Probability of a Fuel Cask Drop Accident to an Acceptably Low Level and Amendment Nos. 37 and 35 to License Nos. DPR-29 and DPR-30 (Quad Cities Station, Units 1 and 2); dated January 27 1977
- Safety Evaluation Report (SER) for the Control of Heavy Loads Phase 1 at Quad Cities Units 1 and 2, dated June 27, 1983
- Work Order 1414083-01; Lift Rig Pin NDE; dated February 16, 2012
- Work Order 1435442-01; Greasing of Reactor Building Overhead Crane Motors; dated December 26, 2012
- Work Order 01502896-01; Reactor Building Overhead Crane Annual Inspection; dated December 28, 2012
- Work Order 01502897-01; Functionality Check and Calibrate the RBOC Lift Overload Trip; dated December 31, 2012
- Work Order 01538521-01; (LR) Reactor Building Overhead Crane Inspection; dated August 6, 2012
- Work Order 01586730-01; Reactor Overhead Crane Inspection; dated November 21, 2012
- Condition Report Reviewed During NRC Inspection (OpESS FY2007-03)
- AR 1324502; RPV Head Strongback Carousel Lifting Rig Pins; dated February 8, 2012
- Condition Reports Initiated as a Result of NRC Inspection (OpESS FY2007-03)
- AR 1512087; NRC Heavy Loads-UFSAR Not Updated Per NEI 08-05 Recommendation; dated May 9, 2013
- AR 1517108; Rx Head and DW Head Strongback Drawing Discrepancies; dated May 23, 2013
- AR 1517133; RBOHC Load Limit and the Strongback Carousel; dated May 23, 2013
- AR 1517114; Dryer/Separator Strongback Calculation Discrepancies; dated May 23, 2013
- AR 1517106; Rx Head and DW Head Strongback Calc Discrepancies; dated May 23, 2013

Section 1R22

- QCOS 1400-01; Quarterly Core Spray System Flow Rate Test; Revision 41
- QCOS 7500-08; Unit 2 Standby Gas Treatment Initiation and Reactor Building Ventilation Isolation Test; Revision 22
- QCOS 1600-07; Reactor Coolant Leakage in the Drywell

Section 1EP6

- EP Drill Scenario for Team “B” on April 30, 2013
- EP Drill Scenario for Team “C” on May 9, 2013

Section 2RS8

- 10 CFR50.59 Evaluations for Abandoned Equipment; Various Records
- Outdoor Container Log/Inspection Log; Various Records
- Training Qualification Records; Various Records
- QC-12-026; Radioactive Waste Shipment; Spent Resin; October 9, 2012
- QC-12-027; Radioactive Waste Shipment Reactor Water Cleanup Resin; October 16, 2012
- QC-12-123; Radioactive Waste Shipment –Recirculation Pump Impeller; May 30, 2012
- QC-13-050; Radioactive Waste Shipment of Filters and Miscellaneous Materials; June 11, 2013
- QC-13-343; Radioactive Material Shipment – Outage Equipment; March 29, 2013
- RW-AA-100; Process Control Program for Radioactive Wastes; Revision 8
- RW-AA-102; Radwaste Storage Facility/DAW Waste Container Inspections; Revision 4

- RW-AA-104; Radwaste Storage Facility/Waste Container Inspections; Revision 4
- RP-AA-376; Radiological Postings, Labeling and Markings; Revision 6
- RP-AA-376-1001; Radiological Posting, Labeling and Marking Standard; Revision 7
- RP-AA-600; Radioactive Material/Waste Shipments; Revision 12
- RP-AA-600-1001; Exclusive Use and Emergency Response Information; Revision 8
- RP-AA-600-1004; Radioactive Waste Shipments to Energy Solutions Clive Utah Disposal Site Containerized Waste Facility; Revision 11
- RP-AA-600-1005; Radioactive Material and Non Disposal Waste Shipments; Revision 15
- RP-AA-601; Surveying Radioactive Material Shipments; Revision 14
- RP-AA-602; Packaging of Radioactive Material Shipments; Revision 18
- RP-AA-602-1001; Packaging of Radioactive Material/Waste Shipments; Revision 14
- RP-AA-603; Inspection and Loading of Radioactive Material Shipments; Revision 8
- RP-AA-603-1001; Inspection and Loading of Radioactive Material/Waste Shipments; Revision 2
- RP-AA-605; 10 CFR 61 Program; Revision 5
- RP-QC-300-1001; Radiological Survey Surveillance Program; Revision 8
- AR01360912; NOS ID: Radioactive Waste Manifest Error; April 30, 2012
- AR01423836; NOS ID: Incorrrect Survey Date Used for Radwaste Shipment; October 8, 2012
- AR1451155; Self-Assessment for NRC Inspection Procedure 71124.08; April 30, 2013
- AR01526621; Barrel 675 Survey Didn't Include External Contamination Level; June 19, 2013
- AR01527122; Comments on RW-AA-100 Revision 0; June 20, 2013
- AR01527125; Turbine Railroad Car Covers have Gaps with Bottom; June 20, 2013
- AR01527363; DOT Type A Cask Shipped Without Properly Dated Engineering Evaluation; June 21, 2013

Section 4OA1

- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 6
- LS-AA-2100; Monthly Data Elements for NRC Reactor Coolant System (RCS) Leakage; Revision 6

Section 4OA2

- IR 01500819; Poor Wiring Connectors Identified During QCOS 0203-08
- EC 393465; Review of Wiring Connections on Unit 1 ERVs in 1-2201-32 For Seismic Loads
- EC 393475; ERV Function with Degraded Terminations as Described in IR 01500819
- WO 1633265; Poor Wiring Connectors Identified During QCOS 0203-08
- WO 1030790; Prints Don't Reflect Correct Wiring on Terminals
- IR 01517584; Discrepancy in Documentation Related to ERV Terminations
- IR 1521898; Unexpected Loss of Transformer 22; 6/5/2013
- QCOA 6100-01; Loss of Reserve Auxiliary Transformer 12(22) During Power Operations; Revision 30
- QCOA 6300-02; Loss of 13.8KV; Revision 00
- QCOA 3500-01; Feedwater Temperature Reduction With Main Turbine Online; Revision 34
- IR 1485944; Unit 1 Outboard Main Steam Isolation Valves (MSIVs) Failed to Close Within Technical Specification Closure Time Criteria; 3/11/2013
- Apparent Cause Evaluation for IR 1485944
- IR 1504021; Review of QCOS 0250-04, MSIV Closure Timing from Q1R22; 4/19/2013
- EC 360620 Rev 1; MSIV Closure Timing Acceptance Criteria
- QCOS 0250-04; MSIV Closure Timing; Revision 25

Section 4OA3

- LER 254/2013-001-00, “Emergency Diesel Generator Cooling Water System Not Aligned”
- IR 01482214; 1/2 DGCWP Found Lined Up to Incorrect Unit
- TS 3.7.3 and Associated Bases
- QCAN 901(2)-3 H-7, Revision 7; RHR Pump Area High Temperature
- QCOS 1400-16, Revision 0; Unit 1 Division II Core Spray Logic Functional Test
- QCOP 6600-15, Revision 11; 1/2 Diesel Generator Cooling Water Pump Cross Connect Alignment
- Calculation RSA-Q-90-02, Revision 0; ECCS Pump Room Transient Response to Loss of Room Cooler for Quad Cities Units 1 and 2
- IR 159607; Pressure boundary leakage from 2” Reactor Head Vent line 1-0215-2”-B due to poor weld quality; 05/20/2013
- Root Cause for IR 159607
- IR 1492804; Pressure Boundary Leakage on Unit 1 Class 2 Reactor Head Vent Piping during Refueling Outage VT-2 Examination; 03/26/2013
- Apparent Cause for IR 1492804

Section 4OA7

- IR 01506966; Incorrect Tubing Installed on 1C RHR Pump Seal Cooler
- EC 378152; Replace the 1A and 1C RHR Pump Seal Coolers
- WO 1395471; Replace the 1A RHR Pump Seal Cooler per 378152
- EN 48916; Degraded Electrical Connectors
- IR 01500819; Poor Wiring Connections Identified During QCOS 0203-08
- EC 393465; Review of Wiring Connections on Unit 1 ERVs in 1-2201-32 For Seismic Loads
- EC 393475; ERV Function with Degraded Terminations as Described in IR 01500819
- IR 01517584; Discrepancy in Documentation Related to ERV Terminations (NRC Identified)
- 4E-1461; Schematic Diagram Auto Blowdown Part I

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DGCW	Diesel Generator Cooling Water
DRP	Division of Reactor Projects
EC	Engineering Change
EDG	Emergency Diesel Generator
ERV	Electromatic Relief Valve
FSAR	Final Safety Analysis Report
HCU	Hydraulic Control Unit
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
LER	Licensee Event Report
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PI	Performance Indicator
RCS	Reactor Coolant System
RFO	Refueling Outage
RHR	Residual Heat Removal
RPV	Reactor Pressure Vessel
SSC	Systems, Structures, and Components
SSMP	Shutdown Safety Management Plan
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
URI	Unresolved Item
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 05000254/2013003 and 05000265/2013003
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ™

DISTRUBUTION:
See next page

DOCUMENT NAME: Quad Cities IR 2013003
☒ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ☒ Non-Sensitive
To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

OFFICE	RIII		RIII		RIII		RIII	
NAME	CPhillips:rj		CLipa					
DATE	07/22/13		07/22/13					

OFFICIAL RECORD COPY

Letter to M. Pacilio from C. Lipa dated July 22, 2013

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2013003
AND 05000265/2013003

DISTRIBUTION:
Vivian Campbell
RidsNrrDorlLpl3-2 Resource
RidsNrrPMQuadCities Resource
RidsNrrDirsIrib Resource
Chuck Casto
Cynthia Pederson
Steven Orth
Allan Barker
Carole Ariano
Linda Linn
DRPIII
DRSIII
Patricia Buckley
Tammy Tomczak
ROPreports.Resource@nrc.gov