



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
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LISLE, IL 60532-4352

November 1, 2010

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

**SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2  
NRC INTEGRATED INSPECTION REPORT 05000254/2010004;  
05000265/2010004**

Dear Mr. Pacilio:

On September 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. The enclosed report documents the results of this inspection, which were discussed on October 5, 2010, with Mr. R. Gideon 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.

Based on the results of this inspection, one self-revealed finding of very low safety significance was identified. The finding involved a violation of NRC requirements. However, because of the very low safety significance, and because the issue was entered into your corrective action program, the NRC is treating the issue as a non-cited violation (NCV) in accordance with Section 2.3.2 of the NRC Enforcement Policy. Additionally, a licensee-identified NCV is listed in Section 4OA7 of this report.

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

M. Pacilio

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, 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 document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Mark A. Ring, Chief  
Branch 1  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000254/2010004; 05000265/2010004  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-254, 50-265  
License Nos: DPR-29, DPR-30

Report No: 05000254/2010004 and 05000265/2010004

Licensee: Exelon Nuclear

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

Location: Cordova, IL

Dates: July 1 through September 30, 2010

Inspectors: J. McGhee, Senior Resident Inspector  
B. Cushman, Resident Inspector  
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Approved by: M. Ring, Chief  
Branch 1  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000254/2010004, 05000265/2010004; 07/01/2010 - 09/30/2010; Quad Cities Nuclear Power Station, Units 1 & 2; Other Activities.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding was identified by the inspectors. The finding was considered a non-cited violation (NCV) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. 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: Initiating Events

- Green. A self-revealed finding of very low safety significance (Green) and associated NCV of 10 CFR 50.65(a)(4) was identified for failure to assess and manage risks associated with maintenance activities. The applicable maintenance activities occurred between July 1, 2010, and August 17, 2010, on Unit 2. The inspectors determined that the licensee's actions to assess and manage the risks associated with maintenance activities did not prevent a transient that upset plant stability, and were identified as a performance deficiency. The inspectors identified that this finding has a cross-cutting aspect because the licensee failed to verify the validity of the underlying assumptions supporting the work activity and identify possible unintended consequences (H.1(b)).

The inspectors determined the finding was more than minor because the performance deficiency adversely affected the Initiating Events Cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Using IMC 0609, Table 4a, Initiating Events Cornerstone column, Transient Initiators subsection; the question: "Does the finding contribute to both the likelihood of a reactor trip AND that mitigation equipment or functions will not be available?" was answered, "No" by the inspectors because all mitigating functions were available after the event. Therefore, this finding screens as Green, or very low safety significance. (Section 4OA3)

### B. Licensee-Identified Violation

One violation of very low safety significance was identified by the licensee and has been reviewed by inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

## **REPORT DETAILS**

### **Summary of Plant Status**

#### **Unit 1**

Unit 1 operated at 100 percent thermal power from July 1 through August 11, 2010, with the exception of planned power reductions for routine surveillances.

At 03:58 a.m. on August 12, 2010, during a condenser circulating water flow reversal with the unit at 100 percent power, high main condenser backpressure caused a turbine trip with a subsequent automatic scram on turbine stop valve closure. Circulating water valves required to reposition as part of the flow reversal failed to move as expected. The resulting reduced circulating water flow to the condenser caused condenser vacuum to lower rapidly (rising backpressure). Sufficient circulating water flow was available to re-establish vacuum after the turbine trip and allow the bypass valves to control reactor pressure. Event Notification 46169 documents the uncomplicated scram, and the event is discussed further in Section 4OA3 of this report. Unit 1 performed a normal reactor startup and was synched to the grid on August 14. Unit 1 achieved full power at 08:31 p.m. on August 15, 2010. Power reductions were subsequently required to adjust control rod patterns on August 22 and August 24 as a result of the unplanned shutdown and associated restart.

On August 28, 2010, operators lowered reactor power to 92 percent thermal power to control cell temperature in the 1B adjustable speed drive (ASD) B-1 cell. The licensee raised cooling flow to the cell in conjunction with the load drop to stabilize temperature. On August 30, power was lowered to 90 percent when temperature in the cell again started to rise. After the cell was bypassed, reactor power was raised to 100 percent thermal power at 11:00 p.m. on August 30, 2010.

Unit 1 operated at 100 percent thermal power throughout the remainder of the evaluated period from August 31 through September 30, 2010, with the exception of planned power reductions for routine surveillances, planned equipment repair, and control rod maneuvers.

#### **Unit 2**

Unit 2 operated at 100 percent thermal power from July 1 through August 16, 2010, with the exception of planned power reductions for routine surveillances.

At 02:14 p.m. on August 17, 2010, a manual scram was inserted on Unit 2 due to rapidly rising reactor water level. The water level increase was caused by a trip of the 2B reactor recirculation pump. Restoration of the 2B recirculation pump programmable logic controller on the 2B adjustable speed drive was in progress at the time of the event. The magnitude of the level transient was further impacted by the 2B feedwater regulating valve being in manual control when the transient started. Operators responded in accordance with procedures and consistently with the pre-evolution briefing. Event Notification 46184 documents the uncomplicated scram, and the event is discussed further in Section 4OA3 of this report. Unit 2 performed a normal reactor startup and was synched to the grid on August 20, 2010. Unit 2 achieved full power at 02:35 a.m. on August 22, 2010.

Unit 2 operated at 100 percent thermal power throughout the remainder of the evaluated period from August 23 through September 30, 2010, with the exception of planned power reductions for routine surveillances, planned equipment repair, and control rod maneuvers.

## 1. REACTOR SAFETY

### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### 1. External Flooding

###### a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, compared current high river flow conditions to historical and predicted data, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written and appropriately evaluated potential collateral impact to plant equipment.

This inspection constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01-05.

###### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04)

##### .1 Quarterly Partial System Walkdowns

###### a. Inspection Scope

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

- Unit 1 high pressure coolant injection (HPCI) system;
- Unit 2 standby liquid control (SBLC) system; and
- Unit 1 1A core spray (CS) system.

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 that system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Fire Zone 11.1.3, Unit 1 Reactor Building, Elevation 554'-0", Unit 1 High Pressure Coolant Injection Room;
- Transient Combustible walkdown with site fire marshal;
- Fire Zone 7.1, Unit 1 Turbine Building, Elevation 628'-6", Unit 1 250V Battery Room;
- Fire Zone 6.2.A, Unit 2 Turbine Building, Elevation 615'-6", 'A' Battery Charger Room; and
- Fire Zone 8.2.6.E, Unit 2 Turbine Building, Elevation 595'0", Reactor Feed Pump.

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 of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- Unit 1 turbine building basement; and
- Unit 2 turbine building basement.

This inspection constituted two internal flooding samples as defined in IP 71111.06-05.

b. Findings

No findings of significance were identified.

.2 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas without dewatering

devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a review of the following underground bunkers/manholes subject to flooding:

- Switchyard Control Power Cables in Manholes 3 and 4.

This inspection constituted one underground vault sample as defined in IP 71111.06-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On July 19, 2010, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations 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 sample as defined in IP 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- Function Z5795: Main Control Room Ventilation System; and
- Function Z3200: Feedwater.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

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

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

b. Findings

No findings of significance were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- Work Week (10-30-05) - Unit 1 reactor core isolation cooling (RCIC) submarine door, 1A core spray pump suction valve VOTES test, emergent offsite switching activities that affected onsite risk;
- Work Week (10-31-06) - Impact of impending weather with flood stage river level, failure of Unit 1 & Unit 2 diesel generator cooling water pump (DGCWP) flow tests, and rescheduling of Unit 2 EDG surveillance;
- Work Week (10-32-07) - Emergent failure of 2C residual heat removal service water (RHRSW) pump and Unit 2 DGCWP, 1A RHRSW pump coupling problem and resulting schedule changes;
- Work Week (10-38-13) - Unit 2 'A' loop of residual heat removal (RHR), 'A' loop of RHRSW, 2A RHR room cooler; and
- Work Week (10-39-01) - Unit 1 emergency diesel generator (EDG) and DGCWP, high radiation sample system motor control center inspection, transformer T12 to Bus 14 cubicle inspection.

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.

These maintenance risk assessments and emergent work control activities constituted five samples as defined in IP 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Issue Report (IR) 1086791, RHR/CS Pump Seal Repair Kits Non-Conforming;
- Engineering Change (EC) 380680; OP-EVAL for RHR Service Water MO 2-1001-5B Analysis;
- IR 1087784, Level III Ground on the Unit 2 125VDC Battery System;
- EC 380819, Acceptable Preconditioning of TS Pressure Switches;
- IR 1094310 & 1094488, U2 & U1 DGCWP to EDG Low Flow Rate; and
- EC 380867; Quad Cities Spent Fuel Pool Criticality Evaluation with Additional BORAFLEX Degradation.

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 six samples as defined in IP 71111.15-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- Work Order (WO) 1356832: Unit 2 DGCWP to ECCS Room Cooler Flow Rate Low;
- WO 1351590: 2D RHR Pump Tripped When Starting per QCOS 1600-06 (Replacement of pump breaker position switch);
- WO 1311500: Replace DSA of Merlin Gerin 4kV Breaker 293;
- WO 1356032-01: OP QCOS 1400-8 Core Spray Valve Timing Test (Loop A); and
- WO 1334957: Service Building Ventilation System 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 testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the

equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

.1 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for a Unit 1 forced outage (Q1F61) that began on August 12, 2010, and continued through August 14, 2010. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed or reviewed the reactor shutdown and cooldown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, startup and heatup activities, and identification and resolution of problems associated with the outage. Additional information for this Unit 1 forced outage is contained in Section 4OA3 of this report.

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

b. Findings

No findings of significance were identified.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for a Unit 2 forced outage (Q2F65) that began on August 17, 2010, and continued through August 20, 2010. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed or reviewed the reactor shutdown and cooldown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, startup and heatup activities, and identification and resolution of problems associated with the outage. Additional information concerning licensee activities during this Unit 2 forced outage is contained in section 4OA3 of this report.

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

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- QCOS 1000-04, Residual Heat Removal Service Water Pump Operability Test for 2C/2D RHRSW Pumps (IST);
- QCOS 1400-08, Core Spray System Power Operated Valve Test for 2A Core Spray (IST);
- QCOS 6600-01, Unit 1 Emergency Diesel Monthly Load Test (IST); and
- QCOS 1600-07, Reactor Coolant Leakage in the Drywell (RCS).

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

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria 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 were in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy, applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability, tests were performed in accordance with the test procedures and other applicable procedures, jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;

- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on August 10, 2010, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.



#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151)

###### .1 Safety System Functional Failures

###### a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for Units 1 and 2 for the period from the second quarter of 2009 through the third quarter of 2010. To determine the accuracy of the performance indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period of July 1, 2009, through June 30, 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

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

###### b. Findings

No findings of significance were identified.P

##### 4OA2 Identification and Resolution of Problems (71152)

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

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

###### a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that 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: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that 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 attached List of Documents Reviewed.

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 of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

.3 Selected Issue Followup Inspection: Virus Found on Adjustable Speed Drive Human-Machine Interface

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting a computer virus detected on the 1B reactor recirculation pump adjustable speed drive (ASD) human-machine interface computer. The initial condition was this condition was entered into the licensee's CAP as IR 1107278. Troubleshooting identified that the virus was on all four ASD units and this condition was identified in the licensee's CAP as IR 1107278. The virus was determined to be a Windows operating system Trojan virus designed to steal financial information and did not otherwise impact the human-machine interface computer. The licensee completed threat assessments by the computer incident response team, the ASD vendor, and the virus protection provider before they developed the virus specific corrective action plan. Actions were implemented to remove the virus as well as to improve controls designed to prevent inadvertent introduction of malware and computer viruses.

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

b. Findings

No findings of significance were identified.

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 Unit 1 Main Turbine Trip on Main Condenser Low Vacuum and Reactor Scram

a. Inspection Scope

The inspectors reviewed the plant's response to a main turbine trip and automatic reactor scram that occurred on Unit 1 at 03:58 a.m. on August 12, 2010. When the scram occurred, a condenser circulating water flow reversal was in progress with the unit at 100 percent power. Circulating water valves required to reposition as part of the flow reversal failed to move as expected. The resulting reduced circulating water flow to the condenser caused condenser vacuum to lower rapidly (rising backpressure). High main condenser backpressure resulted in a turbine trip with a subsequent automatic scram on turbine stop valve closure. Sufficient circulating water flow was available to re-establish vacuum after the turbine trip and allow the bypass valves to control reactor pressure. Event Notification 46169 documents the uncomplicated scram.

The circulating water valve failures were the result of two different failures that occurred sequentially in the process. First, motor-operated valve 1-4402D failed to open when called upon because foreign material in the breaker contactor caused excessive resistance across the auxiliary contact when the contact was closed. As a result, permissives were not satisfied to open the valve. When the reversing sequencer incomplete sequence timer actuated, operators appropriately took the flow reversal switch back to the original direction in accordance with operating procedure instructions. The second failure occurred when motor-operated valve 1-4403B failed to reopen after the motor overloads tripped. The overloads tripped as a result of high electrical current drawn during valve operation due to a combination of high ambient temperature where the valve was located, recent operation of the valve in the first part of the sequence, and three circulating water pumps providing flow to the condenser creating a higher resistance to valve operation. The licensee entered the event into the corrective action process as IR 1100602, replaced suspect contactors, and put procedural actions in place to verify that valve position permissives were appropriately satisfied before beginning a circulating water flow reversal. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

.2 Trip of the 2A Reactor Recirculation Pump While Performing Programmable Logic Controller Resynchronization for the 2A Adjustable Speed Drive Resulting in a Manual Scram of Unit 2 on Reactor Water High Level

a. Inspection Scope

The inspectors reviewed the licensee's response to a Unit 2 manual scram on August 17, 2010. At 2:15 p.m., the licensee was performing maintenance to restore redundant operation of the 2A adjustable speed drive (ASD) programmable logic controllers (PLCs). During this evolution, the 2A ASD tripped and opened the field breaker for the 2A recirculation pump motor. The loss of the 2A recirculation pump

resulted in an increase in reactor water level. When reactor water level reached 44 inches, operators inserted a manual scram as discussed during the pre-job brief. All rods fully inserted. Reactor water level was returned to and maintained in the normal band with normal feedwater control. There were no complications during the shutdown. There were no safety system actuations and no safety system actuations were expected.

Quad Cities Unit 1 was unaffected by the Unit 2 scram and remained at full power. Documents reviewed in this inspection are listed in the Attachment to this report.

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

b. Findings

(1) Recirculation Pump Trip During Resynchronization of the 2A ASD PLC

Introduction: A self-revealed finding of very low safety significance (Green) and associated NCV of 10 CFR 50.65(a)(4) was identified for failure to assess and manage risks associated with maintenance activities to prevent plant transients that upset plant stability. The applicable maintenance activities occurred between July 1, 2010, and August 17, 2010, on Unit 2.

Description: During the post-trip review of the Unit 2 manual scram, it was discovered that two risk assessment and risk management decisions contributed to this event. Inadequate assessment and mitigation of the risks associated with these decisions is a performance deficiency with similar issues in the decision making process. For the purpose of this report, these performance deficiencies will be documented as a single violation with two examples:

**Recirculation Pump Trip during Resynchronization of the 2A ASD PLC**

Each recirculation pump adjustable speed drive unit has two redundant programmable logic controllers (PLCs). The 'A' PLC and the 'B' PLC are synchronized to allow for a bumpless transfer in the case of a failure of the controlling PLC. On August 3, 2010, the backup PLC, 'B' in this case, lost synchronization with the 'A' PLC. In this condition, the 'B' PLC would not perform its redundant control function until reset with the 'A' PLC.

On August 16, 2010, the 2A ASD lost communication with the reactor recirculation control system (RRCS). This failure prevented operators from adjusting reactor recirculation pump speed from the control room. One step of the troubleshooting plan for this condition was to resynchronize the 'B' PLC of the 2A ASD. While the licensee had previously resynchronized the PLCs online with no adverse consequences, the evolution had not been performed with no communication between the RRCS and the controlling PLC. The licensee worked with the vendor to develop the work instruction to resynchronize the 2A ASD 'B' PLC. The vendor performed simulations to support the ability to resynchronize the 'B' PLC on the 2A ASD without causing a trip of the 2A ASD and the loss of the 2A reactor recirculation pump. While validating simulator test data provided by the vendor, the licensee identified that the local/remote switch on the 2A ASD was in the local position during the vendor simulations. This switch was in the remote position on the Quad Cities 2A ASD. The licensee questioned the vendor if the discrepancy in the switch position would result in a different simulated outcome. The vendor responded that the switch position would have no effect on the results of the

simulation. A test was not performed on the vendor's simulator to verify this theory prior to performing maintenance activities. A simulation performed by the vendor following the event resulted in the same outcome as experienced by the licensee on August 18, 2010. Had the challenge been validated on the vendor simulator, the licensee could have managed the risk associated with the maintenance activity to prevent the recirculation pump trip and the resulting reactor water level transient.

On August 17, 2010, the work instruction was performed to resynchronize the Unit 2 2A ASD 'B' PLC. Unit 2 was at full power, the 2A ASD was in speed hold, and the 2B feedwater regulating valve (FRV) was in manual. During the performance of the work instruction to synchronize the 2A ASD 'B' PLC, the 2A ASD tripped, resulting in the loss of the 2A recirculation pump. The 2A recirculation pump trip caused significant reactor power and reactor water level transients that were terminated by the manual reactor scram when reactor water level reached 44 inches.

### **2B Feedwater Regulating Valve (FRV)**

Following Quad Cities Unit 2 refueling outage number 20 (Q2R20) in the spring of 2010, the 2B FRV was observed to exhibit excessive valve hunting while in automatic, as documented in IR 1061078. Troubleshooting was unable to restore smooth operation to the 2B FRV to match the observed operation of the 2A FRV. Even with the noted abnormal operation of the 2B FRV, operators were able to maintain reactor water level stable and in the normal control band. On July 1, 2010, the licensee documented the basis for a decision to delay maintenance and continue operating the 2B FRV in manual on an operation and technical decision making (OTDM) issue resolution form. The OTDM documented the basis for the decision to operate with the 2B FRV in manual with the 2A FRV controlling reactor water level in automatic. The OTDM recommended that operators place the 2B FRV in automatic to respond to a reactor water level transient, and these instructions were implemented through night orders and pre-evolution briefings. On August 17, 2010, when the operators placed the 2B FRV in auto in response to the rapid reactor water level increase caused by the recirculation pump trip, the movement of the 2B FRV was noted as "sluggish." When examined, it was determined that the 2B FRV performed as designed. When the 2B FRV was placed in automatic, there was a difference between the actual valve position and the demanded valve position. The 2B FRV moved at a slower speed until reaching the demand position and then moved at normal valve speed. The observed initial slower speed is a design feature intended to limit level fluctuations when transferring a FRV from manual to automatic during normal operations. The result of the slow valve travel during the actual transient was that water level in the reactor vessel continued to rise until operators took manual action to shutdown the reactor at 44 inches.

While developing the OTDM for the 2B FRV, the licensee performed transient and scram scenarios with the 2B FRV in manual to verify safe operation. During these scenarios, the licensee would start the scenario with the 2B FRV in manual and would place the 2B FRV in automatic during the transient with no adverse consequences noted. However, the licensee assumed that when placed in auto in response to a rising reactor water level transient, the 2B FRV would immediately reposition to the demand position. This assumption was not validated by either simulation or design documentation for the specific scenario of a rising reactor water level transient. The 2B FRV exhibited the same observed performance characteristics when a re-created scenario was performed on August 18, 2010, on the training simulator. Since the design operation of the 2B FRV

was not fully understood, the OTDM did not assess the risk and operational impact of the slower valve speed on mitigating a rising reactor water level transient.

Analysis: The inspectors concluded the inadequate assessment and management of risk for the maintenance activities discussed above were performance deficiencies. These performance deficiencies were more than minor because the performance deficiencies adversely affected the Initiating Events Cornerstone attribute of equipment performance and cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations.

Using IMC 0609, Table 4a, Initiating Events Cornerstone column, Transient Initiators subsection; the question: "Does the finding contribute to both the likelihood of a reactor trip AND that mitigation equipment or functions will not be available?" was answered "No" by the inspectors because all mitigating functions were available after the event. Therefore, this finding screens as Green, or very low safety significance. The inspectors identified that this finding has a cross-cutting aspect. The licensee failed to verify the validity of the underlying assumptions of risk-significant decisions and identify possible unintended consequences (H.1(b)).

Enforcement: Title 10 CFR 50.65(a)(4) requires, in part, that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the maintenance activity.

Contrary to the above, between July 1, 2010, and August 17, 2010, the licensee failed to assess and manage the risk associated with maintenance activities on the Unit 2 2B FRV and 2A ASD to prevent a significant reactor power and reactor water level transient. Because this violation was determined to be of very low safety significance, and these issues have been entered into the licensee's corrective action program as Issue Reports 1102590 and 1061078, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000265/2010004-01, "Unit 2 Manual Scram"**).

Corrective actions included corrective maintenance of the 2B FRV control systems to restore functionality while in automatic control. Also, corrective maintenance was performed on the 2A ASD to restore redundancy of the 2A ASD PLCs and to restore the normal remote control functions.

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On October 5, 2010, the inspectors presented the inspection results to R. Gideon, 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. Proprietary material received during the inspection was returned to the licensee.

#### 4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3.2 of the NRC Enforcement Policy for being dispositioned as an NCV. be implemented covering the procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1976. That revision of Regulatory Guide 1.33 states, in part, procedures for performing maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above, temporary equipment of sufficient size and mass to compromise the seismic qualification of safety-related switchgear was erected to support maintenance and left in place in violation of plant procedural requirements. Specifically, on August 23, 2010, the licensee identified that a Tele-tower, an adjustable work platform, had been installed to support work in the overhead on WO 715454, "Cable Tray Cover Missing." After the work had been completed and the platform was documented as removed, a supervisor touring the plant, looking for potential problematic issues, identified that the platform was not removed, was in contact with the nearby safety-related switchgear 13, and, therefore, was not in compliance with MA-QC-716-026-1001, "Seismic Housekeeping." The issue was documented in the licensee's CAP as IR1104846, and the tower was removed as part of the immediate corrective actions. The finding was determined to be more than minor because documentation had been improperly completed after an apparently inaccurate verbal communication stating that the Tele-tower had been removed from the plant. As a result, no management controls were in place to limit the risk exposure for the safety-related equipment. Therefore, the procedure non-compliance adversely affected the External Events attribute of the Mitigating Events Cornerstone objective to ensure availability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance because all of the questions of IMC 0609, Table 4a for Mitigating Systems were answered "No," and the finding is screened as Green.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

M. Prospero, Plant Manager  
R. Gideon, Site Vice President  
D. Barker, Operations Director  
W. Beck, Regulatory Assurance Manager  
J. Burkhead, NOS Manager  
D. Collins, Radiation Protection Manager  
S. Darin, Engineering Director  
R. Gaylord, Training Support Manager  
V. Neels, Chemistry/Environ/Radwaste Manager  
P. Summers, Maintenance Director  
D. Thompson, Security Manager

Nuclear Regulatory Commission

M. Ring, Chief, Reactor Projects Branch 1

Illinois Emergency Management Agency

C. Settles, Section Head

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

50-265/2010004-01	NCV	Unit 2 Manual Scram
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Closed

50-265/2010004-01	NCV	Unit 2 Manual Scram
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Discussed

None



## LIST OF DOCUMENTS REVIEWED

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

### Section 1R01

- UFSAR Chapter 2.4, Hydrologic Engineering
- QCOA 0010-06; Key Phone Numbers and Checklists; Revision 13
- QCOA 0010-16; Flood Emergency Procedure; Revision 12

### Section 1R04

- QCOS 2300-10; HPCI Monthly Valve Position Verification; Revision 8
- QOM 1-2300-02; HPCI system Fuse and Breaker Checklist; Revision 5
- QOM 1-2300-01; U1 HPCI Valve Checklist; Revision 12
- QCOP 2300-01; HPCI Preparation for Standby Operation; Revision 55
- AR 1091206 "QOM 1-2300-02 Had Wrong EPN for HPCI Gland Seal Hotwell Pump"
- QCOP 1100-01; Standby Operation of Standby Liquid Control System; Revision 12
- QOM 2-1100-02; Standby Liquid Control System Fuse and Breaker Checklist; Revision 7
- QOM 2-1100-02; Unit 2 SBLC Valve Checklist; Revision 8
- QCOP 1400-10; Core Spray Operability Verification; Revision 20
- QOM 1-1400-09; Unit 1 A Core Spray Valve Checklist; Revision 5

### Section 1R05

- Pre-Plan RB-1N; Unit 1 Reactor Building Elevation 554'0" Unit 1 HPCI & HPCI Access Tunnel; Fire Zone 11.1.3
- Pre-Plan RB-1N; Unit 1 Reactor Building Elevation 554;0" Unit 1 Torus Area and Top of Torus; Fire Zone 1.1.1.1
- Pre-Plan TB-101; Unit 2 Turbine Building Elevation 615'6" "A" Battery Charger Room; Fire Zone 6.2A
- Pre-Plan TB-79; Unit 1 Turbine Building Elevation 628'6" 250V Battery Room; Fire Zone 7.1A
- Pre-Plan TB-73; Unit 2 Turbine Building 595'0" Elevation Reactor Feed Pumps; Fire Zone 8.2.6.E

### Section 1R06

- WO# 1333745 – Manhole 3 & 4 Water Intrusion Inspection; 08/02/2010

### Section 1R11

- Simulator Scenario (Loss of Stator Cooling/Main Steam Line Break in the Turbine Building with Failed Group 1 Isolation/Propagating Recirculation Leak/Top of Active Fuel Blowdown)

### Section 1R12

- Evaluation of System Performance Report for the Z5795 Functions (CR HVAC System) from 06/01/09 - 07/01/09

- Evaluation of System Performance Report for the Z5795 Functions (CR HVAC System) from 06/01/10 - 07/01/10
- ER-AA-310-1004; Maintenance Rule – Performance Monitoring; Revision 8
- ER-AA-310-1005; Maintenance Rule – Dispositioning Between (a)(1) and (a)(2); Revision 5
- ER-AA-310; Implementation of the Maintenance Rule; Revision 8
- Periodic Evaluation; 10 CFR 50.63(a)(3) Periodic Evaluation Assessment Period: 05/01/08-05/01/2010; 07/30/10
- MRULE Expert Panel Minutes; MRULE Expert Panel 06-25-09 Thursday, 1400-1530, PMMR
- WO 1082326-01; Vibration Issue - U0 Control Room HVAC Chiller Compressor
- ER-AA-310-1004; Attachment 8 Function Failure Cause Determination Evaluation; Evaluation for Issue Report 914984, 915057 and 915765; Revision 7
- IR 910666; Old B CR HVAC RCU Found with Broken Rod
- IR 914984; PSU - 1/2B CR HVAC RCU Breaker Tripped MCC 18-4 Cub 1D
- IR 1098331; MRULE Performance Criteria for CR HVAC Clarification Needed
- Evaluation of System Performance Report for the Z3200 Functions (Feedwater) from 08/01/08 - 07/31/10

### Section 1R13

- Quad Cities risk evaluation for work week 10-30-05
- Quad Cities risk evaluation for work week 10-31-06
- Quad Cities risk evaluation for work week 10-32-07
- EC 380977; Evaluation of Bus 25 and 26 Crosstie Loading to Support 2C RHRSW Breaker Work while Unit 2 is in Mode 1; Revision 00
- Quad Cities risk evaluation for work week 10-38-13
- Quad Cities risk evaluation for work week 10-39-01

### Section 1R15

- IR 1086791; Nonconformance of Installed RHR/CS Pump Seal Repair Kits
- EC 380677; Nonconforming Condition of the Safety-Related Qualification Documentation of the Seal Repair Kits Installed in the RHR and Core Spray Pump Seal Assemblies
- EC 380680; OP-EVAL for RHR Service Water MO 2-1001-5B Analysis
- IR 1086805; MO 2-1001-5B Will Only Close 40 percent
- EC 380749; Level III Ground on the Unit 2 125Vdc Battery System
- DC Systems Grounds Task Force Report Revision A
- IR 1092774; NRC TIA 2009-006, Unacceptable Preconditioning
- EC 380819; Acceptable Preconditioning of Tech Spec Pressure Switches
- IR 1093883; Vendor Error in BADGER SFP (Spent Fuel Pool) Rack Testing Report
- EC 380867; Quad Cities Spent Fuel Pool Criticality Evaluation with Additional BORAFLEX Degradation
- GL 96-04; BORAFLEX Degradation in Spent Fuel Pool Storage Racks
- IR 1094310; U2 DGCWP To EDG HX Flow Rate Low
- IR 1094488; U1 EDG Cooling Water Low Flow After Start
- IR 1097678; Low Flow From U2 EDGCWPP to U2 EDG HX During QCOS 5750-09
- IR 1098995; Adverse Trend; U2 EDG Cooling Water Total Flow Indication
- WO 1356832; U2 DGCWP to ECCS Rm Cooler Flow Rate Low
- IR 1105446; Aborted QCOS 6600-41 Due to Low Flow to U1 EDG
- IR 1105210; U1 EDG Monthly Test Aborted Due to Low CW Flow to EDG
- WO 1350731; ECCS Room and DGCWP Cubicle Clr DP Test
- EC 381002; Evaluation of EDG HX Flow Rate for Functional Impact; Revision 0

### Section 1R19

- WO 1351590; 2D RHR Pump Tripped When Starting per QCOS 1000-06
- QCOS 1000-06; RHR Pump Loop Operability Test; Revision 48
- WO 1311500; Replace DSA of Merlin Gerin 4kV Breaker 293
- COS 1400-01; Quarterly Core Spray System Flow Rate Test; Revision 39
- WO 1207279-01; EM MO 1-1402-3A Perform Static VOTES Test
- WO 1207279-01; OP QCOS 1400-8 Core Spray Valve Timing Test (Loop A)
- IR 1097678; Low Flow from U2 EDGCWP to U2 EDG HX during QCOS 5750-09
- WO 1356832; U2 DGCWP to ECCS Room Cooler Flow Rate Low
- WO 1350731; ECCS Room and DGCWP Cubicle Cooler Differential Pressure Test
- IR 1098995; Adverse Trend: U2 EDG Cooling Water Total Flow Indication
- QCOS 5750-03; Manual Isolation of Control Room Ventilation; Revision 0
- QCOS 5750 -15; Containment and Control Room Ventilation Boundary Smoke Test; Rev 0
- WO 1334957; Service BLDG Ventilation System Replacement EC-361274

### Section 1R22

- QCOS 1000-04; Residual Heat Removal Service Water Pump Operability Test; Revision 49
- QCOS 1400-08; Core Spray System Power Operated Valve Test; Revision 22
- QCOS 6600-41; Unit 1 Diesel Generator Load Test; Revision; Revision 035
- QCOS 6600-41; Unit 1 Diesel Generator Load Test; Revision; Revision 036
- IR 1105210; U-1 EDG Monthly Test Aborted Due to Low CW Flow to EDG
- IR1105446; Aborted QCOS 66-41 Due to Low Flow to U1 EDG
- EC 381002; Evaluation of EDG Hx Flow Rate for Functional Impact; Revision 000

### Section 1EP06

- EP-AA-1006; Radiological Emergency Plan Annex for Quad Cities Station; Revision 29

### Section 4OA2

- IR 1107278; Computer Virus Detected on 1B ASD HMI
- IR 1108407; Computer Virus Confirmed on 1A, 2A, 2B ASD HMI
- Nuclear Event Report NC 10-050-R; Discovery of Software Virus on Adjustable Speed Drive Human Machine Interface (Quad Cities)

### Section 4OA3

- EN 46169; Unit 1 reactor Automatic Scram Due to Turbine Trip
- QOA 3300-02; Loss of Condenser Vacuum; Revision 36
- QOA 5600-04; Loss of Turbine Generator; Revision 27
- USAR Section 10.4.5; Circulating Water System
- IR 1104031; NOS ID U1 Post Transient Review Package Deficiencies
- IR 1100692; Main Turbine Trip Was Received
- IR 1100602; U1 Rx Scram Due to Loss of Condenser Vacuum
- IN 2010-17; Common Cause Failure of Boiling-Water Reactor Recirculation Pumps with Variable Speed Drives
- Q1F61 Post Transient Review Package
- OP-AA-106-101-1006; Operational and Technical Decision Making
- IR 1102590 – U2 Manual SCRAM on Rising RPV Water Level;

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
ASD	Adjustable Speed Drive
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CS	Core Spray
DGCWP	Diesel Generator Cooling Water Pump
EC	Engineering Change
EDG	Emergency Diesel Generator
FRV	Feedwater Regulating Valve
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Issue Report
NRC	Nuclear Regulatory Commission
NCV	Non-Cited Violation
OTDM	Operation and Technical Decision Making
PARS	Publicly Available Records System
PI	Performance Indicator
PLC	Programmable Logic Controller
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RRCS	Reactor Recirculation Control System
SBLC	Standby Liquid Control
SDP	Significance Determination Process
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order

M. Pacilio

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Sincerely,

**/RA/**

Mark A. Ring, Chief  
Branch 1  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000254/2010004; 05000265/2010004  
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Letter to M. Pacilio from M. Ring dated November 1, 2010

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2  
NRC INTEGRATED INSPECTION REPORT 05000254/2010004;  
05000265/2010004

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