IEMA
Illinois Emergency Management Agency
Division of Nuclear Safety

Pat Quinn, Governor
Andrew Velasquez III, Director
Joseph G. Klinger, Assistant Director

March 31, 2009

United States Nuclear Regulatory Commission - Region III
Quad Cities Nuclear Station
22710 206th Avenue North
Cordova, IL 61242

Attention: Mr. James McGhee

SUBJECT: IEMA – Bureau of Nuclear Facility Safety, Inspection Report
Quarterly Inspection Period: January 1 to March 31, 2009

Dear: Mr. McGhee,

On March 31, 2009 the Illinois Emergency Management Agency-Bureau of Nuclear Facility Safety Resident Inspector completed the quarterly inspection activities at the Quad Cities Nuclear Station, Units 1 and 2. Per the terms and conditions of the Memorandum of Understanding (MOU) between the NRC and IEMA-BNFS, the enclosed inspection report documents our agency's inspection issues and concerns that were previously discussed with you and members of your resident inspection staff.

The IEMA-BNFS inspection activities were conducted as they relate to nuclear safety and to compliance with the Commission's rules and regulations and with the conditions of the plant license. The inspector(s) reviewed selected licensee procedures and records, observed licensee activities, and interviewed licensee personnel.

Specifically, the inspection activities for this period focused on those inspection modules that were proposed to your NRC inspection staff as identified in the Fourth Quarter IEMA Inspection Plan and are disseminated within the text of the attached IEMA-BNFS Inspection Report.

Based on the results of this inspection, the inspectors identified the following IEMA-BNFS Open / Follow-up Items and are discussed within their respective report reference ( ):

H-73

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1. The inspector will verify that procedure QCOS 2300-23 rev 6, HPCI Motor Speed Changer Timing Test, is revised. (**1R19**)

2. The inspector will review the outcome of IR 894959 and its impact on Quad Cities Procedure QCOA 0010-09, UFSAR section 3.7.4, and any other impacted documents. (**1EP6.2**)

3. The inspector will follow the investigation into the impact on the DEHC system from the KVM switch. (**4OA2.2**)

In addition, the following IEMA Inspector items that were being tracked by IEMA, are considered **Closed** to further review and are discussed within their respective report reference ( ):

1. Inspector's verification that the licensee is documenting control rod exercising and maintaining permanent records of activities affecting quality (**1R04.2**)

2. The inspector's verification that procedure QCOP 1300-09 is revised to remove the dichotomy between procedural steps. (**1R04.3**)

3. The inspector's follow-up investigation on the design difference in hangers between Unit 1 and 2 for the Torus vent line to verify that Unit 2 does meet its design requirement. (**1R04.4**)

4. The licensee's resolution of issues involving the Main Steam Safety Valve set point acceptance criteria (**4OA2.3**)

Any issues, open items and/or concerns that are discovered during the course the inspection period are normally entered into the IEMA – Bureau of Nuclear Facility Safety Plant Issues Matrix, and by this letter, are considered as disseminated to your NRC staff for disposition in accordance with NRC policies and procedures. In full cooperation with the and at the request of the NRC, IEMA-BNFS will continue to follow and assist the NRC Resident Inspection Staff with resolution and closure of all such issues, open items and/or concerns.

In full cooperation with and at the request of the NRC, IEMA-BNFS will continue to follow and assist the NRC Resident Inspection Staff with resolution and closure of all such issues and concerns.

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If you have any questions, please contact me at your earliest convenience.

Sincerely yours,

Richard J. Zuffa
IEMA-BNFS/RI Unit Supervisor
Resident Inspection Staff

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30
Enclosure(s): Inspection Report: 09QC-1QIR
cc w/o encl: A.C. Settles, Chief Division of RICC
C.H. Mathews, IEMA-BNFS-RI

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IEMA INSPECTION REPORT SUMMARY
09QC-1QIR

STATION: Quad Cities	UNIT 1 – DOCKET NO: 50-254 UNIT 2 – DOCKET NO: 50-265
IEMA INSPECTORS:	Charlie Mathews
INSPECTION PERIOD:	January 1 through March 31, 2009
NRC REPORT NUMBER:	2009-002
INSPECTION HOURS:	110
SUBMITTED TO NRC ON:	March 31, 2009
INSPECTION SUBJECT:	Safety Inspection of the Quad Cities Nuclear Power Station
VIOLATIONS:	None
OPEN ITEMS:	Three

1. The inspector will verify that procedure QCOS 2300-23 rev 6, HPCI Motor Speed Changer Timing Test, is revised. (**1R19**)

2. The inspector will review the outcome of IR 894959 and its impact on Quad Cities procedure QCOA 0010-09, UFSAR section 3.7.4, and any other impacted documents. (**1EP6.2**)

3. The inspector will follow the investigation into the impact on the DEHC system from the KVM switch. (**4OA2.2**)

UNRESOLVED ITEMS:	None
ITEMS CLOSED:	Four

1. Inspector's verification that the licensee is documenting control rod exercising and maintaining permanent records of activities affecting quality (**1R04.2**)

2. The inspector's verification that procedure QCOP 1300-09 is revised to remove the dichotomy between procedural steps. (**1R04.3**)

3. The inspector's follow-up investigation on the design difference in hangers between Unit 1 and 2 for the Torus vent line to verify that Unit 2 does meet its design requirement. **(1R04.4)**

4. The licensee's resolution of issues involving the Main Steam Safety Valve set point acceptance criteria **(4OA2.3)**

Report Details

Plant Status

Unit 1

Unit 1 operated the entire inspection period at near full rated electrical load of 912 MWe, with the following exceptions: Small power reductions were performed as required facilitating planned condenser flow reversals.

On January 30th, the unit power was reduced to 840 MWe to support a planned control rod shuffle.

On March 15th, unit power was reduced to 668 MWe to support a planned scram time testing surveillance, turbine valve testing and channel distortion testing.

Unit 2

Unit 2 operated the entire inspection period at near full rated electrical load of 912 MWe, with the following exceptions: Small power reductions were performed as required facilitating planned condenser flow reversals.

On January 14th, the unit power was increased to 100% reactor power, which corresponded to an increase of approximately 40 MWe to perform testing of plant equipment.

On February 22nd, unit power was reduced to approximately 720 MWe to allow isolation of the 2B Feedwater Regulating Valve when it failed to respond to feedwater controller demand.

On March 7th, unit power was reduced to approximately 720 MWe to allow for scram time testing and turbine valve testing.

1. REACTOR SAFETY

Initiating Events, Mitigating Systems, Barrier Integrity

1R04.1 Equipment Alignment (IEMA Keystone: Reactor Safety) (71111.04)

a. Inspection Scope

The inspector performed equipment configuration alignment and general area inspections in the following plant areas:

- Main Control Room and Back Panel Areas
- Unit 1&2 Reactor Feed Water Pump Rooms
- Unit 1&2 4 KV Buses (safety and non-safety)
- Unit 1&2 High Pressure Coolant Injection (HPCI) Rooms
- Unit 1&2 Residual Heat Removal Service Water (RHRSW) Pump Vaults
- Unit 1&2 Reactor Building Corner Pump Rooms
- Shutdown Makeup pump (SSMP) Room
- Unit 1&2 and Unit ½ Emergency Diesel Generator (EDG) Rooms
- Refuel Floor

b. Observations and Findings

During walk down inspections of plant equipment areas, the inspector verified equipment configuration and observed for any material condition deficiencies that could prevent proper equipment operation. Equipment areas were inspected for system leakage, personnel safety hazards, potential interference with system components and controls, fire hazards, water intrusion, and the integrity of system structural supports. The inspector monitored equipment areas for abnormal vibration, odors, sounds, or other conditions that could impact proper equipment operation and plant safety.

On January 7, the inspector while touring the power block, identified high oil levels on the 2A and 2B Standby Liquid Control System (SBLC) pump motors; low oil level on the 1A Control Rod Drive pump motor and pump; and some unusual labeling on containment pressure switches. The unusual labeling attached to containment pressure switches stated, "Refer to QCOP 1600-29 before manipulating this valve – primary containment could be violated", then gave the pressure switch number, for example PS 1-1001-90A.

The inspector, through investigation determined that removal or disassembly of the pressure switch could potentially open a direct path from the primary containment to secondary containment. Since mechanical maintenance workers performed maintenance on the wrong equipment 3 days earlier due to misleading labeling on plant equipment, the inspector provided this information to the Shift Manager for resolution.

On January 9, the inspector verified that the SLC pump oil levels were within their normal operating band. The inspector also reviewed IR 865106 which was initiated to correct the valve labeling and on January 12, the inspector received an email from the licensee informing him that new labels had been installed under IR 865106 and that oil had been added to the 1A Control Rod Drive (CRD) pump and motor. The inspector verified on January 14 that the new labels had been installed.

On March 3, the inspector identified a 3 dpm leak from the ceiling above the 1B Core Spray (CS) room. The inspector reported this condition to the Shift Manager who had it investigated and determined that the leak was from a previously identified packing leak from root valve (1-3199-63C) in the D-Heater Bay, located directly above the 1BCore Spray (CS) room. The previously installed catch container for this leak was no longer capturing the leakage and needed adjustment for proper fluid capture (IR 888642). The leaking valve is scheduled to be repacked during refueling outage Q1R20 under Work Order #1204489.

On March 10, the inspector determined from the operations log that in addition to the Unit 2 Station Black Out (SBO) Diesel Generator (DG) being out of service for scheduled maintenance, that the ½ Diesel Generator was inoperable due to a scheduled surveillance run, thus two diesel generators were out of service. The inspector referenced Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.1, AC Sources-Operating, and determined that if two required diesel generators were out of service that the station would be in a two hour shutdown action statement. The inspector reviewed the Technical Specification LCO Basis for 3.8.1, AC Sources-Operating and found no definition for equipment requirements. The inspector then talked to the Unit 1 Supervisor and found that the SBO DGs are not included in the required DGs per the Technical Specification and therefore not considered as technical specification limiting equipment.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R04.2 Equipment Alignment (IEMA Keystone: Reactor Safety) (71111.04)

(Closed) **Open Item 07QC-4QIR-002:** The inspector's verification that the licensee is documenting control rod exercising and maintaining permanent records of activities affecting quality, i.e., Reactor Mode Switch position.

On September 10, 2007 while reviewing the Main Control Room logs, the inspector identified that on September 8, 2007, at 4:07 am, that Unit 1 reached Mode 3 (Hot Shutdown). Thirteen minutes later, at 4:20 am, the mode switch was moved, by procedure, from the SHUTDOWN to the REFUEL position. The mode switch remained in the REFUEL position until September 10, 2007, at 6:40 pm when the unit entered mode 2 for reactor restart. The Mode switch was in the REFUEL position for approximately 62 hours and 20 minutes with no documented control rod movement.

The inspector reviewed the main control room logs on Monday September 10, and seeing no main control room log entries describing control rod movement, questioned main control room operators regarding the current mode switch position and if any control rod movement was in progress. The inspector was informed by operations that they had been "stroking rods" and that they were having problems with the Rod Position Indicating System (RPIS) that might require them to move additional control rods for post maintenance (PM) testing. No mention of control rod motion was ever recorded in the Main Control Room log.

The inspector reviewed Exelon corporate procedure OP-AA-111-101, revision 6. OPERATING NARRATIVE LOGS AND RECORDS, to determine the requirements that Exelon required for the level of detail for main control room logs. Exelon procedure OP-AA-11-101, step 4.1.1 states "Maintain records at a level of detail that will allow reconstruction of shift activities by oncoming personnel that do not have the benefit of a face-to-face discussion with the shift." Contrary to this requirement, the main control logs for September 8-10, 2007 made no mention of any control rod movement even though main control room operators stated that they were moving control rods intermittently through out the entire outage. In response to this issue generated by the inspector, IR # 692880 was initiated.

On September 20 and 21, 2007, the inspector attempted to obtain documentation corroborating the intentional movement of control rods

during the Unit 1 outage September 8-10, 2007. The inspector talked to the Control Rod Drive (CRD) System Engineer, the Operations Records Coordinator, and Station Nuclear Engineers looking for verbal and documented evidence of control rod movement. All three personnel thought that control rods had been exercised, but none had any documentation. The CRD System Engineer stated that procedure QCOP 0300-18, rev. 18. CONTROL ROD EXERCISING should have been performed and that she would continue to look for a copy. The inspector was later informed that the completed procedure, QCOP 0300-18, had been inadvertently shredded. The inspector was informed by operations personnel that procedure QCOP 0300-18 has a "life of plant" retention requirement. In response to this issue, IRs # 692865 and #680638 were initiated.

On October 2, 2007, the inspector, along with the NRC Senior Resident Inspector, determined that procedure QCOP 0300-18 on step F.4, directed the operators to place the mode switch in to the REFUEL position per procedure QCOP 0500-06, rev. 7, MOVING THE REACTOR MODE SWITCH OUT OF SHUTDOWN POSITION, but QCOP 0300-18 did not contain a step to return the mode switch to SHUTDOWN per QCOP 0500-06. This procedure shortcoming resulted in the procedure not being capable of maintaining compliance with TS 3.10.2 & 3 and the reactor mode definition. The licensee revised the procedure to reflect the proper compliance with the Technical Specification equipment specification.

The inspector has monitored mode switch position during the last several plant shutdowns and based upon control room performance and their heightened awareness to Technical Specifications 3.10.1 and 3.10.3, the inspector has determined that the licensee is in compliance with Technical Specification requirements. This item is considered closed.

1R04.3 Equipment Alignment (IEMA Keystone: Reactor Safety) (71111.04)

a. Inspection Scope

(Closed) Open Item 08QC-1QIR-001: The inspector's verification that procedure QCOP 1300-09 has been revised to remove the dichotomy between procedural steps.

On January 15, 2008, the Unit 1 Reactor Core Isolation Cooling (RCIC) System controller failed from its automatic control mode to the manual

mode. A "Fail Red" light was received on the RCIC control room annunciator panel. RCIC was then declared inoperable and unavailable. Following discussions between the Shift Manager and the Station Risk Coordinator, the Shift Manager assigned a dedicated operator (if needed) to perform a manual RCIC start, in accordance with QCOP 1300-09 revision 21, RCIC Local Manual Operation. This operator was not assigned to any specific area to remain in, e.g., the RCIC Pump Room; his instructions only specified that he be able to transit from an unspecified location in the plant to the RCIC controls to perform the local startup of RCIC. Assignment of the dedicated operator and availability of RCIC were based upon the capability to get the RCIC System aligned to inject within 30 minutes, per 10CFR50, Appendix R analysis.

The inspector walked through the performance of QCOP 1300-09 in the field and verified that the procedure could be performed within 30 minutes, but with substantial distance between components in the reactor building and the RCIC room, it would be difficult. The Nuclear Regulatory Commission (NRC) Senior Resident Inspector (SRI) questioned this practice and ultimately determined that RCIC was designed for loss of feedwater transients and thus was necessary to be aligned for injection within approximately 5 minutes.

From the inspector's walk down, it appeared obvious that the operator would not be able to complete this activity within the 5 minute timeframe and thus RCIC would be unavailable. NUMARC 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" stated that credit for a dedicated operator could be given if the function could be promptly restored either by an operator in the control room or a dedicated operator stationed locally for that purpose. Procedural guidance provided in plant procedure WC-AA-101, rev 14, "On-Line Work Control Process" followed the NUMARC document recommendations but was not followed. This resulted in a NRC issued Non-Cited Violation.

In addition to the time issue, the inspector identified several procedure issues that would impede the start-up and/or potentially prevent operation of the RCIC system. Precaution step D.2 of QCOP 1300-09 stated that, "RCIC operation below 400 gpm should be minimized to limit cycling to Turbine Exhaust check valve." Procedure step F.5.6.c directed the operator to establish RCIC discharge flow less then 400 gpm. These two steps were in obvious disagreement. QCOP 1300-09 was subsequently revised; revision 23 incorporated the inspector's comments. The inspector considers this item as closed.

1R04.4 Equipment Alignment (IEMA Keystone: Reactor Safety) (71111.04)

a. Inspection Scope

(Closed) Open Item 08QC-1QIR-003: The inspector performed a follow-up investigation on the design difference in pipe support hangers between Unit 1 and 2 Torus vent lines to verify that Unit 2 met its design requirement.

b. Observations and Findings

On March 20, while touring the Unit 1 reactor building, the inspector noticed a pipe hanger (for an 18" Torus vent line) oscillating underneath a portion of pipe that it apparently should have been supporting. The inspector noticed a second, newer looking, set of pipe hangers on this line also, but the hanger in question was the same as the one on Unit 2.

The inspector brought this condition to the attention of the licensee's engineering department whose response was that Unit 1 underwent a pipe support modification that added the new stronger hangers because of increased calculated loads, and the old hangers were no longer credited with a support function. Therefore, the lack of support by the hanger in question was not an issue since the support function of the hanger was no longer required.

The inspector then questioned the engineer as to why the Unit 2 supports were not the newer style like those found on Unit 1. The response to the inspector's question was that most likely the calculated piping loads associated with each unit were not the same. IR 752598 was initiated to address this issue and the question and was subsequently closed. The inspector has talked to engineering personnel who have provided prints verifying that the pipe arraignment, though different between the units, was per design and was considered adequate. The inspector considers this item as closed.

1R05.1 Fire Protection (IEMA Keystone: Reactor Safety) (71111.05)

a. Inspection Scope

The inspector evaluated the licensee's fire protection program for operational status, and material condition and verified the adequacy of:

- Controls for combustibles and ignition sources within the plant

- Fire detection and suppression capability
- Material condition of passive fire protection features

b. Observations and Findings

The inspector performed regular tours of the Quad Cities power block over the quarter and while on tour, verified compliance with the licensee's fire protection program per procedures OP-AA-201-004 rev 8, Fire Prevention for Hot Work, and OP-AA-201-009 rev 8, Control of Transient Combustible Material.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R06 Flood Protection (IEMA Keystone: Reactor Safety) (71111.06)

a. Inspection Scope

This inspection will verify that the licensee's flood mitigation plans and equipment are consistent with the licensee's design requirements and the risk analysis assumptions.

b. Observations and Findings

On March 3 and 9 the inspector performed walk downs of the Unit 1 and 2 Reactor Building basement and corner rooms to verify that there were no open pathways that could result in flood water migration to multiple areas. No deficiencies were identified. On March 3 the inspector did identify a leak into the 1B Core Spray room from the D-Heater Bay. This deficiency was discussed in section 1R04.1.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R11 Licensed Operator Requalification Program (IEMA Keystone: Reactor Safety) (71111.11)

a. Inspection Scope

The inspector observed licensed operator training in the control room simulator to verify that the facility licensee's requalification program for licensed reactor operators (ROs) and senior reactor operators (SROs) ensured safe power plant operation by adequately evaluating how well the individual operators and crews mastered the training objectives, including training on high-risk (critical) operator actions. Performance of the utility evaluators was also evaluated to verify that they identified all appropriate training issues and potential crew enhancements.

b. Observations and Findings

On February 19, the inspector observed the training week control room exam in the plant simulator. The exam scenario involved a loss of feedwater flow to the reactor resulting in low reactor vessel level. Concurrent with this, a loss of 4 KV Bus 14-1 and the Unit 1 emergency diesel generator also occurred.

The scenario continued with high drywell pressure and the need for the operations crew to enter the Emergency Operating Procedures (EOP) for Containment Control and reactor vessel depressurization. All critical tasks were completed by the operating crew and crew communications were generally good except for the position of unit supervisor. Communications from the unit supervisor position was acceptable but in need of improvement.

In addition to the simulator examination, the inspector attended the instructor pre-job brief and the post-exam debrief and verified that the licensee identified the communication issue described above. The inspector did not identify any issues with this activity that would prevent the operating crew from protecting the health and safety of the public.

The inspector observed the new flat panel screens to be installed in the control room. The operators did not look at these screens and on questioning in the post-exam debrief, the inspector was informed that the operators had not yet been trained on those screens and therefore were not expected to use them.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R12 Maintenance Effectiveness (IEMA Keystone: Reactor Safety) (71111.12)

a. Inspection Scope

The inspector evaluated the licensee Maintenance Rule (MR) Program to verify that Safety System or Component (SSC) performance or condition problems were identified and corrected.

b. Observations and Findings

On January 21, the inspector reviewed Incident Reports (IR) 867347 and 867351 which described a problem with valve packing leaks as evidenced by boron crystals on the valve stems of both Unit 2 Standby Liquid Control (SBLC) system pump suction valves. The inspector walked down the SBLC systems and determined that the Unit 1 SBLC system pump suction valves had packing leaks similar to those of Unit 2. IRs 873445, 873449, and 869809 were initiated based on the inspector's observation. In this case, plant personnel identified a deficiency on Unit 2 SBLC but did not look at Unit 1 SBLC for an extent of condition verification of system packing leaks on identical components.

On January 29, the inspector performed a search and review of IRs that were initiated on the SBLC system from January 29, 2009 back to January 1, 2008, to verify that all of the issues with this system were being captured and resolved. From this review, fifty-six IRs were identified and categorized. The inspector was satisfied that the issues for the SBLC system were being identified and resolution of those issues performed in a timely manner.

The inspector reviewed the out of service hours used in the Maintenance Rule (MR) and verified that while those hours were higher then the inspector anticipated (224 hours per train per rolling 24 month period), they were the same hours used in the plant Probabilistic Risk Assessment (PRA). Because of this, the inspector was satisfied with the out of service hours.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R13 Maintenance Risk Assessment & Emergent Work Evaluation (IEMA Keystone: Reactor Safety) (71111.13)

a. Inspection Scope

The inspector monitored the licensee's on-line risk assessment on a continual basis.

b. Observations and Findings

The inspector monitored the on-duty shift activities concerning risk assessment practices during scheduled plant maintenance and emergent work activities. The on-shift supervisors updated the on-line risk assessments to their appropriate levels when plant conditions warranted and it was their practice to consult the Station Risk Coordinator in the event they encountered an equipment configuration not previously evaluated.

On January 20, the Unit 1 Reactor Core Isolation Cooling System (RCIC) was out of service due to scheduled maintenance. The inspector walked down the major pieces of protected equipment; the Unit 1 High Pressure Coolant Injection System (HPCI) and the Safe Shutdown Makeup Pump (SSMP). The inspector verified that these two systems were aligned to standby status per QCOP 2900-01 rev.27, Safe Shutdown Makeup Pump System Preparation for Standby Operation; and QCOP 2300-01 rev. 50, HPCI Preparation for Standby Operation.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R15 Operability Evaluation (IEMA Keystone: Reactor Safety) (71111.15)

a. Inspection Scope

The inspector reviewed the open operability evaluations for the plant.

b. Observations and Findings

The inspector reviewed the following open operability evaluation:

- 749118/749132; HPCI Restricting Orifices gaskets below rated pressure,
- 782575; Environmental Qualifications of equipment following a Main Steam Line Break

- 822508/824347; DC Battery non-conformance of undersized plate spacers.

No issues or comments were generated.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R19 Post Maintenance Testing (IEMA Keystone: Reactor Safety) (71111.19)

a. Inspection Scope

The inspector verified that post-maintenance test procedures and test activities were adequate to verify system operability, and functional capability.

b. Observations and Findings

Over the inspection period, the inspector reviewed completed Post Maintenance Test (PMT) procedures to verify that repaired systems were made operable. Where IRs were initiated, the inspector verified that the IR condition did not prevent the system from being declared operable.

- For Control Room Ventilation train B; QCOS 5750-11 Rev 29, Control Room Emergency Ventilation Air Conditioning System Test, and IRs 869828 and 869840
- Unit 1 Reactor Core Isolation Cooling (RCIC) System; QCOS 1300-23 rev 15, Unit 1 RCIC Logic Functional Test
- Unit 2 High Pressure Coolant Injection (HPCI) System; QCOS 2300-05 rev 63, Quarterly HPCI Pump Operability Test
- Unit 1 High Pressure Coolant Injection (HPCI) System; QCOS 2300-15 rev 23, HPCI Drain Pot/Steam Line Drain Level Switch, Valve, and Alarm Functional Verification
- Unit 1 A Loop Low Pressure Coolant Injection (LPCI) System; QCOS 1000-31 rev 16, 1A Loop LPCI and Containment Cooling Modes of RHR Non-Outage Logic Test, and IR 875879
- Unit 1 B Standby Liquid Control (SBLC) System; QCOS 1100-09 rev 2, SBLC Pump Post Maintenance Packing Test

No issues were identified with these post maintenance tests.

On January 22, the inspector observed the performance of portions of Valve Operator Test Evaluation System (VOTES) of RCIC Torus Suction Valve 1-1301-25. On January 28, the inspector reviewed the completed datasheets from that testing. No issues were identified.

On February 18, the inspector reviewed the PMT for the Unit 2 High Pressure Coolant Injection (HPCI) System speed changer; QCOS 2300-23 rev 6, HPCI Motor Speed Changer Timing Test. In this PMT, the inspector identified that on step F.1, that the test performer was instructed to record stroke times to 1/10th of a second. The performer circled the step number of this step indicating that he read and understood the step. On procedure step H.2, the motor speed changer start time was recorded as "15". This was not in accordance with step F.1 and with acceptance criteria of $\leq$ 15 seconds; there was a question of whether the acceptance criteria was in fact met.

The inspector discussed this issue with the Shift Operations Superintendent who initiated IR 885737 to document the issue and investigate it. The Shift Operations Superintendent talked to the personnel that performed the surveillance and determined that the stroke time was 15.0 seconds, thus the acceptance criteria was met. The Shift Operations Superintendent also decided to revise QCOS 2300-23 to make it clearer that the stroke time needed to be recorded to the nearest 1/10th of a second by revising the acceptance criteria from $\leq$ 15 seconds to $\leq$ 15.0 seconds.

c. Conclusions

There were no significant issues identified during this inspection activity except a procedural issue associated with QCOS 2300-23. The inspector will verify that procedure QCOS 2300-23 rev 6, "HPCI Motor Speed Changer Timing Test", is revised to reflect the proper timing accuracy of 1/10 second. This is considered an inspector Open Item **[09QC-1QIR-001].**

1R22 Surveillance Testing (IEMA Keystone: Reactor Safety) (71111.22)

b. Inspection Scope

The inspector verified that surveillance testing of risk-significant systems, and components demonstrated that the equipment was capable of performing its intended safety function.

b. Observations and Findings

Over the inspection period, the inspector reviewed completed surveillance procedures to verify that system operability was met. When IRs were initiated, the inspector verified that the IR condition did not prevent the system from remaining operable.

- Unit 2 Average Power Range Monitors (APRM); QCOS 0700-06 rev 25, APRM Flow Biased High Flux (Heat Balance) Calibration Test
- Unit 1 Average Power Range Monitors (APRM); QCOS 0700-06 rev 25, APRM Flow Biased High Flux (Heat Balance) Calibration Test
- Unit 2 Reactor Protection System (RPS); QCOS 0500-12 rev 14, RPS Test Switch Weekly Functional Test
- Unit 2 Reactor Protection System (RPS); QCOS 0500-02 rev 21, Manual SCRAM Instrumentation Functional Test
- Unit 1 High Pressure Coolant Injection (HPCI) System; QCOS 2300-05 rev 63, Quarterly HPCI Pump Operability Test
- Unit 1 A Standby Liquid Control (SBLC) System; QCOS 1100-07 rev 30, SBLC Pump Flow Rate Test
- Unit 1 B Standby Liquid Control (SBLC) System; QCOS 1100-07 rev 30, SBLC Pump Flow Rate Test

The results of the surveillance tests were considered satisfactory by the inspector.

c. Conclusions

There were no significant issues identified during this inspection activity.

1EP6.1 Drill Evaluation (IEMA Keystone: Emergency Preparedness & Planning) (71114.06)

a. Inspection Scope

The inspector evaluated the drill performance of the Technical Support Center (TSC).

b. Observations and Findings

On March 12, the inspector observed the Team "B" TSC drill performance as part of their emergency preparedness performance indicator (PI). The

drill performance was not as polished as the inspector has observed in previous drills and the drill scenario was not free of issues. The inspector was not able to attend the post-exercise critique due to a conflict with other inspection activities, but did talk to the Nuclear Regulatory Commission (NRC) inspector who did attend and was informed that drill deficiencies were identified. The inspector did make several observations on the drill and these observations were forwarded to the licensee's emergency preparedness group. These observations included:

- During an early TSC brief, 3 priorities were discussed by the team, but only one was listed on the station priority board.
- When EAL FA1 was declared due to a leak that raised drywell pressure, EAL MU7 was not included or discussed as a concurrent EAL. The scenario also did not include the EAL, but the scenario acknowledged it should have.
- The EAL Status board did not contain all of the concurrent EALs such as HA5.
- The TSC briefs did not contain a status of the top priorities. With the TSC managing repair and recovery efforts in the field; a discussion of the status of those efforts was needed.

These issues were discussed with the TSC scenario development and evaluation team.

c. Conclusions

There were no significant issues identified during this inspection activity and several inspector observations.

1EP6.2 Drill Evaluation (IEMA Keystone: Emergency Preparedness & Planning) (71114.06)

a. Inspection Scope

The inspector questioned if the Quad Cities reactors should have simulated being shutdown, during the March 12, 2009 TSC drill, following an earthquake that exceeded the Operating Basis Earthquake (OBE).

b. Observations and Findings

As part of the March 12, 2009 drill scenario, a simulated earthquake magnitude of 0.15g occurred. This was above the OBE of limit of 0.12g, but was less then the Safe Shutdown Earthquake (SSE) limit of 0.24g. The

inspector observed that following the earthquake in-excess of the OBE, there was no discussion regarding shutting down either reactor.

The inspector reviewed:

- 10CFR100 Appendix A, Seismic and Geologic Siting Criteria for Nuclear Power Plants
- 10CFR50 Appendix S, Earthquake Engineering Criteria for Nuclear Power Plants
- Regulatory Guide 1.29, rev 3, 1978, Seismic Design Classification
- Regulatory Guide 1.166, 1997, Pre-Earthquake Planning and Immediate Nuclear Power Plant Post Earthquake Actions
- Regulatory Guide 1.143, rev 1, 1979 & 2001, Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants
- NUREG-0800, Standard Review Plan, Seismic Classification
- Quad Cities UFSAR Section 3.7, Seismic Design
- QCOA 0010-09 rev 10, Earthquake

Following a review of the above documents, it appeared to be a requirement to shutdown a nuclear power plant where its' OBE has been exceeded. The Quad Cities UFSAR, section 3.7.4 did not make any statements about performing a plant shutdown, upon exceeding an OBE, but instead stated that if an earthquake occurred with a magnitude between the OBE and Design Basis Earthquake (the same as SSE) that "a thorough visual inspection of plant areas and instrumentation should be made to check for any abnormalities. If conditions were found to be normal, plant operation would be continued or resumed". Plant procedure QCOA 0010-09, rev 10 contained instructions to inspect for damage, but no steps were provided for response actions if damage was found or any conditions to shutdown both reactors upon exceeding an OBE earthquake per 10CFR100 Appendix A. The licensee has initiated IR 894959 to investigate and resolve this issue.

c. Conclusions

The inspector will review the outcome of IR 894959 and its impact on Quad Cities procedure QCOA 0010-09, the UFSAR section 3.7.4, and any other impacted documents. This is considered an inspector Open Item **[09QC-1QIR-002].**

2. RADIATION SAFETY

2OS OCCUPATIONAL RADIATION SAFETY

2OS1 Access Control to Radiological Significant Areas (IEMA Keystone Occupational Radiation Safety) (IP 71121.01 & MC 2515D)

a. Inspection Scope

The inspector conducted walk downs of radiologically controlled areas to verify the adequacy of radiological area boundaries, postings, radiological housekeeping and contamination controls.

b. Findings and Observations

During plant walk downs, the inspector observed access controls and ingress/egress practices through Contamination Area access points. Personnel entering the Contamination Areas on the Refuel Floor and around the Transverse In-core Probe (TIP) area were dressed in the appropriate level of Personnel Anti-Contamination Clothing (PCs) for the work area.

Radiological controls, including postings and roped off areas, were appropriate and contamination controls were satisfactorily implemented.

c. Conclusions

There were no apparent degraded conditions associated with this inspection activity.

2OS3 Radiation Monitoring Instrument (IEMA Keystone Occupational Radiation Safety) (IP 71121.03 & MC 2515D)

a. Inspection Scope

The inspector reviewed the latest calibration test results for the Radwaste Liquid Effluent and the Main Chimney Noble Gas monitors.

b. Observations and Findings

On March 9, 2009, the inspector reviewed the latest calibration test results for the Radwaste Liquid Effluent and the Main Chimney Noble Gas monitors. The Main Chimney Noble Gas monitor was last calibrated in

May of 2007, per CY-QC-110-606 rev 13; Main Chimney Gaseous & Particulate Sampling. The Radwaste Liquid Effluent monitor was last calibrated March 4, 2009 per QCCP 0300-07 rev 12; DAM 4/3 Calibration. This test also set the liquid radwaste discharge Alert and High alarm and Discharge Isolation setpoints.

c. Conclusions

There were no issues of significance identified during this inspection activity.

2PS Public Radiation Safety

2PS1 Environmental Monitoring Program and Radioactive Material Control Program (IEMA Keystone: Public Radiation Safety 2515A, 71122.01)

a. Inspection Scope

The inspector reviewed the results from the last set of 54 Tritium well samples, and liquid and gaseous radwaste releases.

b. Observations and Findings

On March 12th, the inspector received the latest well sample results from the 54 Tritium sample wells. The samples were taken March 6 and 9th.

The groundwater sampling program was intended to monitor the existing plume of tritium (from previous sub-surface piping leaks that were identified and repaired) as it traversed the owner controlled area. Sampling was also designed to provide early warning of any new radioactive leakage. Samples are taken monthly with a minimum detectable level for Tritium established at 200 Pico Curies per liter (pCi/L).

Currently the licensee has concluded that there are no known active Tritium leaks and the well sample data corroborates that conclusion. The latest well sample data indicates that Tritium activity has stabilized overall with concentration levels in most sample wells below those of a year ago. The few sample wells that are higher are attributed to the plume moving toward the southwest, as expected.

There were no liquid radwaste releases to the Mississippi River this quarter.

The inspector reviewed Main Chimney isotropic data for the period January 27 to February 3, 2009 and found that all isotopics were below the permitted levels.

c. Conclusions

The inspector will continue to follow tritium related issues as they pertain to well sample results. There were no issues of significance identified during this inspection activity.

2PS3 Environmental Monitoring Program (REMP) and Radioactive Material Control Program: (IEMA Keystone: Public Radiation Safety) (71122.03)

a. Inspection Scope

The inspector performed a verification of the Radiological Environmental Monitoring Program (REMP) analyses with respect to its impact of radioactive effluent releases to the environment. The inspection was performed to validate the integrity of the radioactive gaseous and liquid effluent release program and to ensure that the licensee's surveys and controls were adequate to prevent the inadvertent release of uncontrolled radioactive contaminants into the public domain.

b. Observations and Findings

On March 12th, the Illinois Environmental Protection Agency (IEPA) visited the Quad Cities Station for their quarterly joint inspection with IEMA. Since the previous IEPA visit on November 18, 2008, little has changed with ground water-related Tritium activity.

A review of the licensee's IRs for the quarter regarding facility REMP sampling issues contained nothing noteworthy.

c. Conclusions

There were no significant issues identified during this inspection activity.

4 ALL Cornerstones

4OA2.1 Identification and Resolution of Problems: (IEMA Keystone: ALL) (71152)

a. Inspection Scope

The inspector reviewed corrective action documents to determine the licensee's compliance with NRC regulations regarding corrective action programs.

b. Observations and Findings

The inspector reviewed every Issue Report (IR) initiated during the quarter to assess whether the site was properly identifying issues. Additionally, the inspector selected several IRs for in-depth review. The IRs assessed by the inspector were the following:

- IR 862855; Mechanical Maintenance workers began work on wrong Service Building chiller vessel,
- IR 863466; Unit ½ Emergency Diesel Generator Silencer Inner Baffle Pipe Support Welds Broken,
- IR 863474; Unit 2 Emergency Diesel Generator Internal Inspection,
- IR 872980; Switchyard Accumulator Placed in Service without State Inspection.

The inspector reviewed a sample of Apparent Cause Report (ACE) documents:

- IR 855368-04; Equipment ACE, 2D1 Upper Bellows Failure,
- IR 858971; Main Power Transformer Output Center B Phase Discovered Damaged while Attempting to Close,
- IR 866242; A High Radiation Area violation occurred during performance of a valve lineup in the Radwaste Basement,
- IR 867102; Gas Circuit Breaker 10-11 Tripped during Extreme Cold Weather,
- IR 872127; Assumptions regarding Environmental Qualification requirements results in system operation outside of qualified conditions; on the Containment Atmosphere Monitoring system.

The inspector reviewed a sample of Root Cause Report documents:

- IR 843846-02; Unexpected Failure of the U2 Emergency Diesel Generator Cooling Water Pump.

The inspector reviewed a sample of Common Cause Analysis documents:

- IR 854524; Procedural Adherence Issues in the Operations Department.

The inspector reviewed a sample of Engineering Changes (EC) documents:

- EC 373602; Unit 2 Emergency Diesel Generator silencer support welds broken.

The inspector reviewed a sample of Quick Human Performance Investigation Reports:

- IR 869830; PowerPlex Demand Link Switch Discovered in Wrong Position.

The inspector reviewed a sample of Operations Technical Decision Making Reports:

- IR 881607; 1-1203-C Reactor Water Clean-Up System Heat Exchanger has developed a water/steam leak.

The inspector reviewed each of the above documents in detail, discussed them with applicable site personnel, and reviewed the applicable governing documents, i.e. Technical Specifications, UFSAR, 10CFR. No issues were identified.

c. Conclusions

There were no significant issues identified during this inspection activity.

4OA2.2 Identification and Resolution of Problems: (IEMA Keystone: ALL) (71152)

a. Inspection Scope

The inspector reviewed IR 884908 for compliance with NRC regulations and plant operations.

b. Observations and Findings

On March 4 the inspector reviewed IR 884908, which states that Feedwater, Reactor Recirculation, and Digital Electro-Hydraulic Control (DEHC) systems are all connected into the Quad Cities Local Area

Network (LAN). This information was contrary to that provided to the NRC Senior Inspector and the IEMA inspector in March of 2008, following the cyber-security event at Browns Ferry.
At the time the IR was initiated, there were no NRC regulations governing connections between site LAN and digital control circuitry; however the installed wired condition was different from that described to the site inspectors from the previous year.

The inspector determined that the offending connection was for a keyboard, video, mouse switch (KVM). A KVM switch would allow an individual to control more then one computer from a single keyboard/monitor/mouse from anywhere if they had electronic access to the KVM switch. The three digital control system computers were not physically connected to the Quad Cities LAN such that files could be transferred between them. The installed configuration would allow an individual with access to the KVM switch, access to Feedwater and Reactor Recirculation System data, but no control functions. The installed KVM switch configuration had the potential to allow an individual to take control of the DEHC system. The impact of the KVM switch connected to the DEHC system was not easily understood and engineering was assigned to determine if the DEHC system could be controlled through this KVM switch.

c. Conclusions

The inspector will follow the investigation into the impact on the DEHC system from the KVM switch. This is considered an inspector Open Item **[09QC-1QIR-003].**

4OA2.3 Identification and Resolution of Problems (IEMA Keystone: Other Activities) (IP 71152)

a. Inspection Scope

(Closed) **Open Item 05QC-3QIR-002** Resolution of issues involving the Main Steam Safety Valve set point acceptance criteria.

Following discussions with the Dresden IEMA RI in 2005, the inspector reviewed licensee documents including the historical data pertaining to main steam safety valve testing at Quad Cities Station. The inspector monitored the status of the licensee's activities following an NRC finding and subsequent Non-cited violation concerning the safety valves. The

inspector worked with the Dresden IEMA Resident Inspector (RI) to provide main steam safety valve failure data in support of his investigation into the related issues.
In 2005, the Quad Cities Station Resident NRC Inspectors had conducted a related inspection, identified a green finding and issued a Non-Cited Violation, NCV 05000254/5005003-07, due to the failure of three main steam safety valves to actuate within plus or minus one percent of the valve's nameplate value during as-found testing as required by the station's Technical Specifications. The licensee's corrective actions included installing new main steam safety valves, submitting the Quad Cities specific information to the NRC and initiating a license amendment to change the main steam safety valve operating tolerance from +/- 1% to +/- 3%.

The inspector reviewed the Technical Specification manual and determined that Technical Specification 3.4.3 was revised in November 2007. The inspector considers this item as closed.

INSPECTION PROCEDURES USED

The following procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

Inspection Procedure	Title	Section
IP 71111-04	Equipment Alignment	R04
IP 71111-05	Fire Protection	R05
IP 71111-06	Flood Protection	R06
IP 71111-11	Licensed Operator Requal Training	R11
IP 71111-12	Maintenance Effectiveness	R12
IP 71111-13	Maintenance Risk Assessments and Emergent Work Evaluation	R13
IP 71111-15	Operability Evaluations	R15
IP 71111-19	Post Maintenance Testing	R19
IP 71111-22	Surveillance Testing	R22
IP 71114.06	Drill Evaluation	EP6
IP 71121.01	Access Control to Radiologically Significant Areas	0S1
IP 71121.03	Radiation Monitoring Instrument	0S3
IP 71122.01	Gaseous and Liquid Effluent Treatment and Monitoring	PS1
IP 71122-03	Environmental Monitoring Program	

	(REMP) and Radioactive Material Control Program	PS3
IP 71152	Identification and Resolution of Problems	OA2

LIST OF ACRONYMS AND INITIALISMS USED IN REPORT

10CFR	Title 10 Code of Federal Regulations
APRM	Average Power Range Monitors
ACE	Apparent Cause Report
CRD	Control Rod Drive
CS	Core Spray
DEHC	Digital Electro-Hydraulic Control
DG	Diesel Generator
EAL	Emergency Action Level
EC	Engineering Changes
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedures
HPCI	High Pressure Coolant Injection
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
IR	Incident Report
KV	kilo-volts
KVM	keyboard, video, mouse switch
LAN	Local Area Networks
LCO	Limiting Condition for Operation
MR	Maintenance Rule Program
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resources Council
OBE	Operating Basis Earthquake
PC	Personnel Anti-Contamination Clothing
PI	performance indicator
PM	post maintenance testing.
PMT	Post Maintenance Test
PRA	Probabilistic Risk Assessment
Q1R20	Unit 1 Refuel outage #20
QCOA	Quad Cities Abnormal Procedure
QCOP	Quad Cities Operating Procedure
RCIC	Reactor Core Isolation Cooling System
REMP	Radiological Effluent Monitoring Program
RHRSW	Residual Heat Removal Service Water
RO	licensed reactor operators
RPIS	Rod Position Indicating System

RPS	Reactor Protection System
SBLC	Standby Liquid Control system
SBO	Station Black Out
SRI	Senior Resident Inspector,
SRO	Senior Reactor Operator
SSC	Safety System or Component
SSE	Safe Shutdown Earthquake
SSMP	Safe Shutdown Makeup pump
TSC	Technical Support Center
U1, U2	Unit 1, Unit 2
UFSAR	Updated Final Safety Analysis Report
VOTES	Valve Operator Test Evaluation System