



Illinois Emergency Management Agency

Division of Nuclear Safety

Pat Quinn, Governor

Andrew Velasquez III, Director

Joseph G. Klinger, Assistant Director

June 30, 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: April 1 to June 30, 2009

Dear: Mr. McGhee,

On June 30, 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-7P



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1. The inspector will continue to investigate the tracking of transient combustible material until a conclusion is reached on the materials identified. **(IR05.1)**

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. The inspector verified that procedure QCOS 2300-23 rev 6, HPCI Motor Speed Changer Timing Test, was revised to instruct the operators to record timing data to the nearest 1/10th of a second. **(IR19.2)**
2. The inspector will reviewed the outcome of IR 894959 and its impact on licensee procedure QCOA 0010-09 and UFSAR section 3.7.4. **(IEP6)**.
3. The inspector followed the investigation into the impact on the DEHC system from the KVM switch. **(40A2.2)**

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.

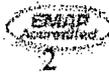
In full cooperation with and at the request of the NRC, IEMA-BNFS will continue to follow and assist the NRC Resident Inspection Staff with resolution and closure of all such issues and concerns.

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

Sincerely yours,

A handwritten signature in black ink, appearing to read "Richard J. Zuffa", written over a horizontal line.

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





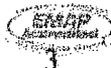
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Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30
Enclosure(s): Inspection Report: 09QC-2QIR
cc w/o encl: A.C. Settles, Chief Division of RICC
C.H. Mathews, IEMA-BNFS-RI

Please visit the nuclear safety section of the Agency's website at www.iema.illinois.gov/iema/dns.asp for the latest information concerning the Division of Nuclear Safety's programs. Our website includes important information such as new and proposed requirements, guidance, events and other pertinent items of interest.



Report Details

Plant Status

On April 4, 2009 the control room felt a bump of the Unit 1 & 2 main generators due to a grid disturbance. The electrical output from both main generators swung greater than 100 MWe. The Transmission Dispatch informed the control room that the swings were caused by an "unspecified grid perturbation outside our grid to the west". IR 902969

On May 19, 2009, IEMA (Springfield) notified Exelon of a loss of data from the Quad Cities Station. Exelon determined that a communication link between the plant process computer and data server for NRC Emergency Response Data System (ERDS) and IEMA data was lost for approximately 65 minutes. This resulted in a Limiting Condition for Operation (LCO) for loss of data to ERDS for greater than one hour. The site acknowledged that the out of service time would have been longer had IEMA not notified Exelon. IR 921719

Unit 1

Unit 1 operated the first month of the inspection period at near full rated electrical output of 912 MWe, followed by a refueling outage and forced outage, then returned to full rated thermal power with electrical output at 925 MWe. The following exceptions occurred in addition to small power reductions as required to facilitate planned condenser flow reversals.

On April 3, the Unit power was reduced to 825 MWe for a control rod pattern adjustment

On April 15, power gradually decreased due to end of cycle coast down.

On April 27, the Unit was shutdown for refuel outage Q1R20.

On May 24, the main generator was synchronized to the grid ending the refuel outage.

On May 25, the reactor was shutdown to repair a Hydrogen (H₂) seal oil leak.

On May 31 the main generator was synchronized to the grid.

On June 6, power was reduced to 725 MWe for a control rod pattern adjustment.

Unit 2

Unit 2 operated the entire inspection period at near full rated electrical load of 912 MWe, until April 22 when power was increased to full thermal power output and 944 MWe output. The following exceptions occurred in addition to small power reductions as required to facilitate planned condenser flow reversals.

On April 13, the Unit power was reduced to 850 MWe for a control rod pattern adjustment.

On April 16, power was reduced to 250 MWe to leak check the main condenser.

On May 29, power was reduced to 725 MWe for control rod scram timing and turbine 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 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 inspected equipment areas 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 March 24, the inspector while touring the power block identified a potential safety hazard in the area of the Unit 2 Standby Liquid Control System. The inspector identified that two ramps bridging the bermed area around the Standby Liquid Control System area were loose with the potential to slide when moving carts over them. The inspector informed plant safety, which confirmed the hazard and repaired the ramps.

On May 20, 2009, while walking down control room panels, the inspector identified that the 1A Recirculation System pump motor temperature was oscillating approximately 80°F on ~a 10 second period. The inspector questioned this recorder response and was told that IR 920820 identified this issue. The inspector reviewed IR 920820 and found that it was closed based on operator statements that the current condition was acceptable. The inspector questioned the control room operators again and found that they did not know the IR had been closed. The inspector spoke with one of the two operators quoted in the IR justifying its closure and determined that; one of the operators had been on leave for the entire outage and the quote was cut and pasted from an IR 3.5 years earlier prior to the Reactor Recirculation system control and recorder upgrade that occurred this outage. Following the inspector's investigation, the control room operators initiated IR 922270 complaining of IR 920820 closure based upon old, out of context information and reopened the issue for review.

On May 4, 2009, the inspector while touring the Unit 1 reactor building basement discovered two radiation protection issues with the potential to spread contamination.

- The inspector identified a white hose used to drain a system in the Unit 1 reactor building basement that was routed through a contaminated trough on the outside of the Torus room. This hose was lying such that instead of following the long path through the floor trough and around a corner, the hose exited the contaminated trough and extended through a clean area then back into the contaminated area. As both ends were not tied off as the hose entered and left the contaminated area, this was not per procedure RP-AA-376-1001 rev 4, step 4.12. IR 915772 was initiated to document this issue.
- The inspector identified that the drain hose for catch containment 2009-026 had been cut off from the funnel and cut again inside a contaminated area where the hose was routed to a floor drain. The catch containment was to collect leakage from a station heating Unit.

Because there was no active leak, the catch containment was removed. IR 914894 was initiated to document this issue.

c. Conclusions

There were no significant issues identified during this inspection activity.

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 nuclear 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.

Between May 29 and June 4, the inspector collected a list of combustible material concerns in the Unit 1 & 2 reactor buildings. These items were tabulated (along with pictures) and turned over to the fire protection group for disposition. The first response from the fire protection group, on June 16, was that the material was included in the combined fire load calculation or was excluded from needing a transient combustible permit (TCP) per procedure OP-AA-201-009 rev 8, Control of Transient Combustible Material. The inspector reviewed the procedure and determined that the items listed by the fire protection group were in violation of procedure OP-AA-201-009. The inspector returned to the fire protection group with additional questions regarding the exemptions from a TCP.

c. Conclusions

The significance of this issue is yet to be determined. The inspector will continue to investigate the tracking of transient combustible material until a

conclusion is reached on the materials identified. This is considered an inspector Open Item [09QC-2QIR-001].

1R05.2 Fire Protection (IEMA Keystone: Reactor Safety) (71111.05)

a. Inspection Scope

The inspector evaluated the licensee's Appendix R emergency light packs for their ability to perform their function during an Appendix R fire.

b. Observations and Findings

While performing regular tours of the nuclear power block over the inspection quarter, the inspector identified a continuous list of issues associated with Appendix R emergency light packs (ELP).

On April 6-8, the inspector researched the eight IRs initiated on ELP #43M that had been out of service since May 23, 2008. Looking through these IRs indicated an ongoing problem with this ELP since August 9, 2007. On April 9, 2009, after reviewing QCAP 1500-01 rev 23, Administrative Requirements For Fire Protection, the inspector questioned fire protection personnel approximately the timeliness of repairs to ELP #43M and the compensatory (comp) measures taken to temporarily perform the function for ELP #43M during this time. The inspector identified that ELP #43M had been out of service for nine months.

As directed by QCAP 1500-01 rev 23, a comp ELP was placed in the area. ELP #43M was installed above the doorway between the 1A Residual Heat Removal (RHR) and the 2B RHR system rooms. The comp ELP was placed on the floor approximately five feet out from the doorway. The comp ELP had two lamps verses the three lamps affixed to ELP #43M. Without a third lamp, and location of the temporary ELP, the inspector did not believe that the comp ELP could illuminate the ELP #43M targets. Per QCAP 1500-01 rev 23, the ELP is only required to illuminate the stairway to the component or the equipment until ELP #43M is returned to service. The inspector reviewed several completed quarterly surveillances, MA-AA-723-350 CGE, Emergency Lighting Battery Pack Quarterly Inspection, for ELP #43M and the comp ELP performed July 7, 2008, January 2, 2009, and April 4, 2009 and determined that aiming of the lamps is to be verified but no sign-off step is provided. IR 912894 was initiated to revise the procedure.

The inspector reviewed Generic Letter (GL) 86-10, Implementation of Fire Protection Requirements, to determine what regulatory guidance was provided through this letter. GL 86-10 directs the reviewer to NUREG 0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants to determine lighting requirements for Appendix R ELPs. NUREG 0800 references NUREG 0700, Human-System Interface Design Review Guidelines to obtain the required illumination levels for plant controls. After researching this document trail, and discussing the issue with the NRC Senior Resident Inspector, the inspector could find no regulation or guidance as to how much lighting is required for a component in the plant. The site Fire Marshal determined that the comp ELP provides sufficient light and documented that opinion in IR 905391.

On April 17, 2009 ELP #43M was repaired and returned to service.

On April 30, 2009, the inspector, after providing ample time for the licensee to evaluate ELP lamp aiming issues and extent of condition, identified six ELPs; two in the 1B RHR room, one in the Unit 1 Torus room, one in the 1A Core Spray room, and two on the Unit 2 reactor building stairwell that were not properly aimed at their target equipment. IR 914851 was initiated and these six ELPs were re-aimed.

On May 14, 2009, the inspector identified that ELP #42 had failed with all of the indicating lights out and the floating indication low. Operations determined the ELP to be inoperable and initiated a work order to repair it and a fire protection impairment. This was documented in IR 919921.

c. Conclusions

The inspector remains concerned with the level of effort allocated to fire protection issues and the fire protection program. The issues described in the above findings and observations, in addition to the yet resolved issue of the ELPs not meeting as built design, suggests a lack of concern by the licensee towards fire protection.

When the inspector turned over the list of ELPs not aimed properly and discovery that there was no sign-off for properly aiming the ELPs; the inspector would have expected the licensee to perform an extent of condition investigation into ELPs for further issues. This does not appear to have occurred as the inspector continues to observe ELP aiming deficiencies.

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 and shutdown 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.

During refuel outage Q1R20, the inspector monitored the daily risk assessment generated for the shutdown Unit 1 and followed revisions to that risk assessment as conditions changed during the outage.

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 open operability evaluations for the plant.

b. Observations and Findings

The inspector reviewed the following open operability evaluation:

- IR 782575; EC 370997 rev 2; Environmental Qualifications of equipment following a Main Steam Line Break; Operability of reactor level indication and other instrumentation due to more severe environmental accident conditions.
- IR 900389; EC 374910 rev 0; Quad Cities auxiliary power analysis calculation due to erroneous non-conservative transformer tapsets.

- IR 892866/880052; EC 374673; Fuel Channel Bowing due to industry initiatives.
- IR 910091; EC 375236; RCIC Pump Turbine Barometric Condenser not draining.

No issues or comments were generated.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IEMA Keystone: Reactor Safety) (71111.17)

a. Inspection Scope

For three major plant modifications installed on Unit 1 during refuel outage Q1R20, the inspector reviewed the 10CFR50.59 evaluations for those modifications to verify that the design bases, licensing bases, and performance capability of Structures, Systems, and Components (SSC) have not been degraded through modifications.

b. Observations and Findings

The inspector reviewed the 10CFR50.59 reviews and summary of changes for the following three plant modification packages installed on Unit 1 during refuel outage Q1R20:

- EC 366310; Reactor Recirculation Motor Generator (MG) Set Replacement with Adjustable Speed Drive (ASD) Units
- EC 345200; Plant Process Computer Replacement
- Switchyard Breaker Replacement per the following ECs:
 - EC 372581
 - EC 372850
 - EC 372851
 - EC 372852
 - EC 372853
 - EC 372854

On May 18, 2009, while reviewing EC 345200; Plant Process Computer Replacement, the inspector questioned cyber-security related to the interconnections of the process computer servers and the Exelon local area network (LAN). On May 20, the inspector met with Exelon information

technology personnel to discuss the issue. With no regulation currently in place, the inspector believes that the licensee has taken reasonable measures to prevent an individual from taking control of Digital Electro-Hydraulic Control System (DEHC) and digital Feedwater, or other parts of the process computer.

On May 20, 2009, the inspector walked down the control room panels and identified a placard on panel 901-4 that stated that "speeds in the 60% range may be unstable". The control room operators were asked if this applied to the ASD modification or if it was a characteristic of the old MG set. The operators emailed the question to the project manager for that modification and the placard was later removed. A note was added to the modification package to remove this placard from Unit 2 when this modification is performed on that unit.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R19.1 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. In instances where an IR was initiated, the inspector verified that the IR condition did not prevent the system from being declared operable. The inspector reviewed the following PMTs:

- For Unit 2 Diesel Generator Cooling Water pump; QCOS 6600-06 Rev 35, Diesel Generator Cooling Water Pump Flow Rate Test,
- For the Safe Shutdown Makeup pump; QCOS 2900-03 rev 17, Safe Shutdown Makeup System Power Operated Valve Test
- For the Unit 2 Station Blackout Diesel Generator; QCOS 6620-01 rev 34, SBO DG 1(2) Quarterly Load Test

No issues were identified with the post maintenance tests.

c. Conclusions

There were no significant issues identified during this inspection activity.

1R19.2 Post Maintenance Testing (IEMA Keystone: Reactor Safety) (71111.19)

b. Inspection Scope

(Closed) Open Item 09QC-1QIR-001: The inspector verified that procedure QCOS 2300-23 rev 6, HPCI Motor Speed Changer Timing Test, was revised to enhance instructions to the operators to record timing data to the nearest 1/10th of a second.

b. Observations and Findings

On February 18, 2009, the inspector reviewed a 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 reviewing 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 neither in accordance with step F.1, nor with acceptance criteria of ≤ 15 seconds. As a result, there was a question of whether the acceptance criteria were in fact met.

The inspector discussed this issue with the Shift Operations Superintendent who initiated IR 885737 to document and investigate the issue. 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. They accomplished this by revising the acceptance criteria from ≤ 15 seconds to ≤ 15.0 seconds.

The inspector verified that QCOS 2300-23, revision 7, revised on March 20, 2009 changed the acceptance criteria to direct the operators to record timing to the nearest 1/10th of a second. This open item is therefore considered closed.

1R20 Refueling and Outage Activities (IEMA Keystone: Reactor Safety)
(71111.20)

c. Inspection Scope

The inspector evaluated licensee outage activities during the Unit 1 Refuel Outage Q1R20, to verify that the licensee considered risk in developing outage schedules; controlled plant configuration; and adhered to operating license and technical specification requirements that ensure defense-in-depth.

The inspector also ensured that areas not accessible during at-power operations were inspected, especially the safety-related and risk significant Structures, Systems, and Components (SSCs).

b. Observations and Findings

Over the course of the Unit 2 Refuel Outage, the inspector toured plant areas not accessible during plant operations. Issues identified are discussed within this section. The areas toured include:

- Unit 1 Torus
- Unit 1 Drywell
- Unit 1 Turbine Low Pressure Heater bay
- Unit 1 High Pressure Heater room
- Unit 1 Main Steam Isolation Valve (MSIV) room

On April 28, 2009, the inspector observed control room operators start and stop the 1A Core Spray (CS) pump to flush piping and raise reactor cavity level. After approximately 10 minutes, the 1A CS pump was secured and the 1B CS was started. This evolution was performed under QCOP 1400-02, rev 10, Core Spray System Manual Initiation. The inspector had no issues but did inquire if it was normal NOT to announce the securing of a major piece of equipment. Shift Manager stated that they do not announce securing equipment only starting them.

On April 28, 2009, the inspector observed visible water flow in the Northwest and Southwest spent fuel pool liner drains. The flows as observed, confirm the inspector's theory that the spent fuel pool liner leakage as observed during the Unit 2 refuel outage in spring 2008 was due to a leak in the reactor vessel pool. There is no safety significance associated with leakage from that pool.

On April 29, 2009, day 3 of the refuel outage, the inspector observed a crew of laborers installing lead shielding onto the 1A Residual Heat Removal (RHR) Heat exchanger. The 1A RHR system was “protected equipment” at the time, with postings at both entrances stating not to perform work on the system without permission from the Shift Manager.

The inspector questioned the workers regarding any briefing they might have received prior to working on “protected equipment” and all that the workers recalled was their Hi Rad and Contamination-zone briefs. The inspector next talked to Unit 1-Unit supervisor and the Shift Manager and discovered that they were not aware of any work in the area and promptly stopped the shielding work.

The inspector later verified later that work had stopped in the room. IR 914011 was initiated to investigate the issue. The conclusion of the IR was that the laborers were looking for work to perform and the contractor Radiation Protection (RP) technician did not see the protected equipment sign because it was blocked by laborers as they entered the area. In addition to this, the same day Nuclear Oversight Group identified unauthorized personnel working on Motor Control Center (MCC) 18/19-5 without the control room’s knowledge. Work was immediately stopped and IR 913001 was initiated for that issue. Over the remainder of the refuel outage, the inspector did not identify any additional instances of unauthorized work on protected equipment.

On May 1, 2009, the inspector identified a puddle of water ~5’ in diameter on the Unit 1 reactor building 666’6” elevation floor area, at column H-13 and near the fire door leading to Unit 2. Radiation Protection (RP) later identified the puddle as water, with a deconning solution that was used on the refuel floor. Per RP, the fill station for the mop buckets was directly above this area and sometimes the laborers would spill liquid when filling their buckets. This spillage would leak to the next floor. RP erected a catch-containment so any spillage would not leak to the lower floor. No more leakage was identified for the remainder of the refuel outage.

On May 7, 2009, the inspector observed the swap of electrical power from normal to alternate, then back to normal, several times, for the Essential Service Water system per QOP 6800-03 rev 30, Essential Service System, steps F.6 and F.7. This breaker and power swap was to allow the breaker vendor to observe the switch operation. There were no issues with this activity.

On May 11, 2009, the inspector observed the Scorpion platform (temporary reactor pool work platform) removed from the Unit 1 reactor pool and moved to the Unit 2 side of the refuel floor. The inspector monitored the heavy lift and movement pathway as it was guided around the refuel floor. The inspector also overheard discussion between the General Electric (GE) refuel floor supervisor and the Exelon refuel floor supervisor regarding the contacting of the control room prior to removing the Scorpion platform from the refuel pool, and the Exelon supervisor stated that he had notified the control room. However, the control room did not realize that the removal of the Scorpion platform would result in a drop in refuel pool level and did not take the appropriate precautions. This evolution resulted in the trip of the fuel pool cooling pumps on low surge tank level. Level was quickly restored and pumps restarted. IR 918439 was initiated to document and investigate the event. The events as described in the IR accurately depicted what the inspector observed.

On May 22, 2009, the inspector monitored the beginning of control rod withdrawals to critical. Quad Cities Unit 1 entered Mode 2 at 1721. Prior to moving control rods, control room operators began testing the new Rod Worth Minimizer (RWM). At 1726 all work stopped because the Rod Worth Minimizer test failed. Control room operators withdrew an out-of-sequence rod to verify the withdrawal block, but when the rod was moved out, in addition to a withdrawal rod block, an insert block were also received. The licensee later determined that the RWM had operated correctly. When the out of sequence rod was selected, control room operators bypassed the withdrawal inhibit, to run the surveillance, to determine that a withdrawal block would occur. To correct the issue a revision was made to procedure QCGP 1-1, rev 77, Normal Unit Startup with a Temporary Interim Change (TIC). The TIC allows them to bypass RWM to insert the rod that was blocked out from moving. At 1926 control room operators began withdrawing control rods to achieve criticality.

c. Conclusions

There were no significant issues identified during this inspection activity.

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

a. 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.

- QCOS 0201-02 rev 25, Reactor Thermal Limitations Surveillance Data Sheet
- QCOS 0300-21 rev 5, CRD Temperature Surveillance
- QCOS 1400-01 rev 36, Quarterly Core Spray System Flow Rate Test
- QCOS 2900-01 rev 28, Safe Shutdown Makeup Pump Flow Rate Test
- QCOS 1400-08 rev 22, Core Spray System Power Operated Valve 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 Drill Evaluation (IEMA Keystone: Emergency Preparedness & Planning) (71114.06)

a. Inspection Scope

(Closed) Open Item 09QC-1QIR-002: The inspector reviewed the outcome of IR 894959 and its impact on Quad Cities procedure QCOA 0010-09, UFSAR section 3.7.4.

As part of the March 12, 2009 drill scenario, a simulated earthquake magnitude of 0.15g occurred. This was above the Operating Basis Earthquake (OBE) of limit of 0.12g, but was less than 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 the shutting down of 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, there 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 regarding the initiation of 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 then 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 if any conditions were met 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.

The inspector reviewed procedure, QCOA 0010-09 rev 11, issued May 13, 2009 and verified that the procedure now directs the operators to shutdown the reactor if an OBE is exceeded. This open item is therefore considered closed.

2. RADIATION SAFETY

2PS Public Radiation Safety

2PS1 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 June 23, the Illinois Environmental Protection Agency (IEPA) visited the Quad Cities Station for their quarterly joint inspection with IEMA. Since the previous IEPA visit on March 12, 2009, little has changed with ground water-related Tritium activity and there is no indication of a new leak.

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.

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

b. Inspection Scope

The inspector reviewed the licensee actions following notification from a scrap metal vendor that porcelain insulators sent to them contained radioactive material.

b. Observations and Findings

On May 7, 2009, United Scrap contacted the Quad Cities site to inform them that old porcelain insulators shipped to them contained radioactive material. The porcelain insulators were replaced as part of the licensee's switchyard upgrade. Prior to the suspect porcelain insulators returning to the site, the inspector reviewed the gamma spectrum analysis of porcelain insulators that had not been shipped. Those porcelain insulators indicated

levels of Lead-214 and Radium-226, which are daughter products of Uranium-238 decay. These are considered naturally occurring.

The porcelain insulators returned from the scrap metal site indicated 1K dpm, on contact and contained the same Uranium-238 decay products.

The porcelain insulators were not surveyed prior to leaving the site because they were never in the protected area and were assumed to be free of radionuclides. The porcelain insulators will remain on site until they can be properly disposed.

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 895589; U1 DEHC Software Improvements
- IR 898897; U1 TIP 2 Withdrawal into the Drive Machine During Testing
- IR 910603; Incorrect R-Factors From Westinghouse Used at QC
- IR 920564; I-80 Detour Impact on ERO
- IR 920820; PSU 1A Recirc Motor Temp pt #3, 4 Oscillating on TR 1-0262-1,

- IR 923468; RCIC Turbine Trip During Performance of QCOS 1300-05,
- IR 926537; Unit 1 3E Relief Valve has High Tail Pipe Temp,

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

- IR 888694; Mechanical Maintenance Technician Injured While Rebuilding Main Steam Isolation Manifolds.
- IR 889203; Security Key Missing From Inventory
- IR 895604; 1A Instrument Air Compressor Trips,
- IR 896659; Repeated Mechanical Seal Failures during Maintenance of 2B RHRSW pump,
- IR 910666-02; Train B CR HVAC Refrigeration Condensing Unit found with a Broken Piston Connecting Rod,
- IR 916132; New Control Blade Discovered With Bent Bail Handle
- IR 918439; U2 Fuel Pumps Tripped Due to Refueling Activities,

The inspector reviewed a sample of Root Cause Report documents:

- IR 906008-02; Unit ½ Emergency Diesel Generator (EDG) Auxiliaries Were Unable to Transfer to Unit 2 Due to Not Effectively Investigating a Blown Fuse Which Caused a Condition Prohibited by Technical Specifications.
- IR 923518; Unable to Obtain H2 Seal Oil Parameters.

The inspector reviewed a sample of Common Cause Analysis documents:

- IR 888235-02; LORT Cycle 09-1 Emergency Planning Weakness.
- IR 898056; Year 2008 Reactivity Management Level 3 Events and Level 4 Precursors

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

- IR 866023-02; Operation of the Quad Cities Station Independent Spent Fuel Storage Installation.

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 Identification and Resolution of Problems: (IEMA Keystone: ALL)
(71152)

a. Inspection Scope

(Closed) Open Item 09QC-1QIR-003: The inspector followed the investigation into the impact on the DEHC system from the KVM switch.

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 than 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.

The KVM switches in question were removed from the DEHC circuitry on April 7, 2009. This open item is therefore considered 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.

<u>Inspection Procedure</u>	<u>Title</u>	<u>Section</u>
IP 71111-04	Equipment Alignment	R04
IP 71111-05	Fire Protection	R05
IP 71111-13	Maintenance Risk Assessments and Emergent Work Evaluation	R13
IP 71111-15	Operability Evaluation	R15
IP 71111-17	Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications	R17
IP 71111-19	Post Maintenance Testing	R19
IP 71111-20	Refueling and Outage Activities	R20
IP 71111-22	Surveillance Testing	R22
IP 71114.06	Drill Evaluation	EP6
IP 71122-03	Environmental Monitoring Program (REMP) and Radioactive Material Control Program	PS3
IP 71152	Identification and Resolution of Problems	OA2

LIST OF ACRONYMS USED IN REPORT

10CFR	Title 10 Code of Federal Regulations
APRM	Average Power Range Monitors
ACE	Apparent Cause Report
ASD	Adjustable Speed Drive
CRD	Control Rod Drive
Comp	compensatory
CR	control room
CS	Core Spray
DEHC	Digital Electro-Hydraulic Control
DG	Diesel Generator
EAL	Emergency Action Level
EC	Engineering Changes

EDG	Emergency Diesel Generator
ELP	Emergency Light Pack
EOP	Emergency Operating Procedures
ERDS	Emergency Response Data System
ERO	Emergency Response Organization
GE	General Electric
GL	Generic Letter
HPCI	High Pressure Coolant Injection
HVAC	Ventilation
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
IR	Incident Report
LAN	Local Area Networks
LCO	Limiting Condition for Operation
MCC	Motor Control Center
MG	Motor Generator
MWe	Mega Watt Electric
NRC	Nuclear Regulatory Commission
OBE	Operating Basis Earthquake
PC	Personnel Anti-Contamination Clothing
PI	performance indicator
PMT	post maintenance testing
PMT	Post Maintenance Test
Q1R20	Unit 1 Refuel outage #20
QCOA	Quad Cities Abnormal Procedure
QCOP	Quad Cities Operating Procedure
REMP	Radiological Effluent Monitoring Program
RHR	Residual Heat Removal System
RP	Radiation Protection Department
RWM	Rod Worth Minimizer
SSC	Structures, Systems, and Components (SSC)
SSMP	Safe Shutdown Makeup pump
TIC	Temporary Interim Change
U1, U2	Unit 1, Unit 2
UFSAR	Updated Final Safety Analysis Report