

# Quad Cities 2

## 4Q/2009 Plant Inspection Findings

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### Initiating Events

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### Mitigating Systems

**Significance:**  Dec 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **TEMPERATURE INDICATING PROBE FOUND BROKEN IN THE UNIT 2 DIESEL GENERATOR COOLANT SYSTEM**

A finding of very low safety significance and an NCV of 10 CFR 50 Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was self-revealed for the installation of an inappropriate component into the Unit 2 emergency diesel generator coolant system. Specifically, the licensee failed to properly perform a part evaluation for a replacement temperature indicator (TI) designated as “augmented quality.” This resulted in the probe of the TI shearing off in the coolant flow stream and causing foreign material to enter the coolant system. Immediate corrective actions included the installation of an appropriately approved TI and recovery of foreign material from the system. The same part evaluation process was used for risk significant components independent of the system being worked. Therefore, this finding was more than minor because, if left uncorrected, this performance deficiency could lead to unplanned unavailability of safety-related or risk-significant equipment and would become a more significant safety concern. The inspectors performed a Phase 1 SDP screening and concluded that the issue was of very low safety significance (Green) because the failure of the TI did not result in unplanned inoperability or loss of function of the diesel generator. The inspectors determined that this finding did not have a cross-cutting aspect. This performance deficiency is not indicative of current licensee performance. The decision to install this type of TI was made in October 2007. The performance deficiency was identified and corrected through procedure and policy revisions in February 2008.

Inspection Report# : [2009005](#) (*pdf*)

**Significance:**  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE OF LICENSEE TO PROPERLY TRANSLATE TS OPERABLE-OPERABILITY**

The inspectors identified a finding of very low safety significance and an NCV of 10 CFR 50 Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure to provide a procedure appropriate to the circumstances for an activity affecting quality. Specifically, the licensee failed to properly translate the Technical Specification (TS) Operable-Operability definition into procedures that established operability of systems affected by a hazard barrier that had been disabled for maintenance. This resulted in the operators disabling an internal flooding barrier without identifying that the affected systems were inoperable. Corrective action included immediate restoration of the barrier and the issue was entered into the licensee’s corrective action program. Subsequently, the procedure was revised to require operators to identify the system as inoperable or employ appropriate compensatory measures to maintain operability when a flooding barrier is impaired.

This issue is more than minor because, if left uncorrected, it could become a more significant safety concern, in that the unit could continue to operate at power for longer than allowed by TS with more than one required emergency core cooling system (ECCS) system exposed to internal flooding from a single failure from a non-Class 1 system and challenging safe shutdown assumptions. The inspectors performed a Phase 1 SDP evaluation and answered “No” to all of the Mitigating Systems questions in IMC 0609, Attachment 4, Table 4a. The issue, therefore, screened as Green or very low safety significance. The incorrect procedural guidance was the principal contributor to the operator’s failure to identify that the affected systems were inoperable, and the inspectors determined that the event is cross-

cutting in Human Performance, Resources, Procedures (H.2(c)).

Inspection Report# : [2009004](#) (pdf)

**Significance:**  Sep 10, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Evaluate Lack of Water Spray System Piping**

A finding of very low safety-significance and associated non-cited violation (NCV) of license condition 3.F for Units 1 and 2 was identified by the inspectors for the licensee's failure to evaluate the lack of supports for a water spray system. Specifically, the licensee failed to evaluate a deviation from fire protection standards for the lack of supports on two sections of water spray system piping. Upon discovery of the unsupported piping, the licensee entered the issues into their corrective action program and performed an evaluation of the piping which subsequently demonstrated acceptability.

The finding was determined to be more than minor because there was reasonable doubt on the acceptability of the unsupported piping. The issue was of very low safety-significance because the piping was subsequently determined to be acceptable. No cross-cutting aspects were associated with this finding because the finding was not representative of current performance. (Section 1R05.4.b(1))

Inspection Report# : [2009006](#) (pdf)

**Significance:**  Sep 10, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Provide Adequate Electrical Coordination for Control Circuit**

A finding of very low safety-significance and NCV of 10 CFR Part 50, Appendix R, Section III.L.3 was identified by the inspectors for the licensee's failure to ensure that the alternate shutdown capability was independent from the fire area of concern. Specifically, the licensee failed to provide adequate electrical coordination of protective devices to ensure that postulated fire-induced electrical faults would have not resulted in the loss of post-fire alternative safe shutdown equipment, i.e., safe shutdown makeup pump. The licensee subsequently entered the issue into their corrective action program, revised the affected safe shutdown procedure, and replaced the affected circuit breakers to improve electrical coordination.

The finding was determined to be more than minor because the failure to ensure adequate electrical coordination between the fuses and the upstream breaker for the safe shutdown makeup pump control circuit could have impacted the capability of achieving and maintaining safe shutdown condition following a postulated fire in the cable spreading room or auxiliary electric equipment room. The issue was of very low safety-significance because there was a high degree of confidence that a fire would be controlled prior to cable damage resulting from credible fire scenarios. No cross-cutting aspects were associated with this finding because the finding was not representative of current performance.

Inspection Report# : [2009006](#) (pdf)

**Significance:**  Jun 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

**INADEQUATE PROCEDURAL GUIDANCE FOR SHUTDOWN AFTER OPERATING BASIS EARTHQUAKE**

A finding of very low safety significance and associated Non-Cited Violation was identified by NRC inspectors for an inadequate procedure, QCOA 0010-09 "Earthquake." This procedure did not direct a shutdown in response to an earthquake event in excess of the operating basis earthquake threshold. 10 CFR 100 Appendix A, Section V(a)(2) states, "If vibratory ground motion exceeding that of the Operating Basis Earthquake occurs, shutdown of the nuclear power plant will be required." Upon discovery, the licensee implemented immediate changes to QCOA 0010-09.

This finding was more than minor because this performance deficiency challenged the Reactor Safety - Mitigating Systems Cornerstone attribute of procedure quality. The inspectors performed a Phase 1 SDP screening using inspection manual chapter (IMC) 0609, Attachment 4, Table 4a for the Mitigating Systems Cornerstone. All questions were answered “no” and the issue screened as Green, or very low safety significance. The inspectors determined that this finding did not have a cross-cutting aspect because this procedure has been in place since initial operation and this deficiency was determined to be a latent issue not readily identified through the procedure revision process.

Inspection Report# : [2009003](#) (pdf)

**Significance:**  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **1/2 EDGCWP FAILED TO SWAP FEEDS**

A finding of very low safety significance and a Non-Cited Violation of Quad Cities Unit 2 Renewed License No. DPR-30 condition 3.B was self-revealed on April 10, 2009, when a previously unidentified blown fuse on a 1/2 emergency diesel generator (EDG) control power transfer circuit resulted in failure of the power supply for associated diesel generator cooling water pump to transfer from Unit 1 to Unit 2. The fuse had apparently failed on March 25, 2009, when operators attempted to replace a burned out light bulb resulting in the diesel being inoperable for Unit 2 for 17 days. Although operators had indications that a circuit problem existed, timely actions were not initiated to ensure the unit continued to operate in accordance with Technical Specifications. Immediate corrective actions were accomplished on April 11, 2009, with replacement of the fuse and verification of circuit operability. Inspectors determined this finding to be cross-cutting in the area of Problem Identification and Resolution for the corrective action component because station personnel failed to investigate the non-conforming condition as directed by station procedures to adequately assess the impact on system operability and did not meet procedural requirements for evaluating operability (P.1(c)).

The inspectors determined the finding was more than minor because the finding is associated with Mitigating Systems cornerstone attribute of equipment reliability and affected the cornerstone objective by impacting availability, reliability and capability of the Unit 2 emergency electrical supplies. Specifically, allowing the non-conforming condition on the 1/2 EDG to linger while performing maintenance activities on the Unit 2 EDG challenged the availability of emergency AC power to Unit 2. The inspectors reviewed this finding in accordance with IMC 0609, Appendix A, “Determining the Significance of Reactor Inspections Findings for At-Power Situations.” The postulated accident where the 1/2 EDG would have failed its safety function is a loss of offsite power to both units followed by a loss of coolant accident on Unit 2. Significance Determination Phase 2 performed by the residents and validated by the regional senior risk analyst show risk significance much lower than  $1 \times 10^{-6}$  threshold and therefore Green.

Inspection Report# : [2009003](#) (pdf)

**Significance:**  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **TRIP OF UNIT 2 FUEL POOL COOLING WATER PUMPS DURING SCORPION PLATFORM REMOVAL**

A finding of very low safety significance and Non-Cited Violation of 10 CFR 50.65(a)(4) was self-revealed on May 11, 2009, when the licensee staff failed to manage water level in the spent fuel pool and associated skimmer surge tanks resulting in the Unit 2 fuel pool cooling pumps tripping off while removing the Scorpion platform from the Unit 1 reactor cavity. Immediate corrective actions for this event included refilling the skimmer surge tank and restarting the fuel pool cooling pumps to restore alternate decay heat removal. The inspectors determined that the failure to take adequate action to manage the risk associated with a maintenance activity with a potential to affect a key shutdown safety function was a performance deficiency and a finding. Inspectors determined that the finding was cross-cutting in the area of Human Performance – Work Control for failure to coordinate work activities by incorporating actions to adequately address the need for work groups to communicate, coordinate and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance (H.3(b)).

The inspectors determined the finding was more than minor because the failure to implement the management actions resulted in the critical safety function being degraded and is associated with 10 CFR 50.65(a)(4) risk management.

The inspectors performed a Phase 1 SDP evaluation and determined that the issue is Green because the Unit 1 pumps

remained running with no issues during the event and plant operators were able to recover the Unit 2 cooling pumps before any discernable change in temperature occurred (answer to all questions of Manual Chapter 0609, Attachment 4, Table 4a, Mitigating Systems Cornerstone and Barrier Cornerstone were “no” and the issue screened as Green). Since the finding concerned risk management actions, the inspectors verified the finding was Green using Manual Chapter 0609, Appendix K flowcharts and validated that there was no change in risk thresholds as a result of the event.

Inspection Report# : [2009003](#) (pdf)

**Significance:**  Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **BROKEN LATCH ON FIRE DOOR 145**

Inspectors identified a Non-Cited Violation of License Condition 3.F, having very low safety significance for failure to ensure that Fire Door 145 could be positively latched. Section 2-8.4.4 of the National Fire Protection Association (NFPA) 80-1975, “Fire Doors and Windows,” required that closing mechanisms be adjusted to overcome the resistance of the latch mechanism so that positive latching is achieved on each door operation. As a result of the discovery of the broken latch, that prevented the fire door from positively latching, the licensee initiated an action request report (AR 864090), and established the immediate actions to return Fire Door 145 to service. The licensee declared the fire door inoperable, issued fire impairment No. 1612 and established an hourly watch. Repairs to the door were completed and the fire door was declared operable the same day.

The finding was determined to be more than minor because a lack of positive latching could result in the door opening during a fire, thereby allowing a fire to affect additional equipment important to safety in the exposed fire zone. Based on screening under IMC 0609, Appendix F, “Fire Protection Significance Determination Process,” the inspectors determined that a Phase 2 analysis was required. The inspectors determined that the change in core damage frequency associated with the finding was significantly less than  $1 \times 10^{-6}$  per year. As such, the finding was determined to be of very low safety significance (i.e., Green). This finding has a cross-cutting aspect in the area of Human Performance for the Resources component because the licensee did not provide adequate training to personnel. Specifically, as noted in the licensee’s corrective action document, annual training on fire barriers was inadequate in that equipment operators (EOs) did not consistently challenge fire doors in accordance with training (H.2(b)).

Inspection Report# : [2009002](#) (pdf)

**Significance:**  Mar 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **FAILURE TO FOLLOW WORK INSTRUCTIONS FOR 2A CORE SPRAY CHECK VALVE**

A self-revealed finding of very low safety significance (Green) and Non-Cited Violation of Technical Specification 5.4.1.a was identified by inspectors on January 15, 2009, when the 2A core spray pump discharge check valve, 2-1402-8A, failed to close. Specifically, the valve failed to close because mechanics did not follow work instructions and ensure the valve was assembled as required. Corrective actions for this event included repair of the valve, briefings with the licensee staff, reinforcement with the operating staff on the differences between operability and post-maintenance testing requirements, and revision of the steps in the “model” work order and the operation’s department surveillance procedure to more clearly delineate the acceptance criteria.

The inspectors determined that the failure to follow the work instructions for the 2A core spray pump discharge check valve was more than minor because the non-conforming valve impacted the Mitigating Systems Cornerstone attribute of Equipment Performance to ensure the reliability and capability of the core spray system to respond to initiating events when returned to service. The inspectors concluded that the issue was of very low safety significance (Green) because the plant operators were able to manually perform the required function and thus maintain both functionality and operability of the system until the valve was repaired. The inspectors determined that failure to provide enough detail in the post-maintenance test acceptance criteria to ensure that the valve was able to perform as designed without operator assistance was a significant contributor to the valve’s subsequent return to service in a degraded condition, and the inspectors concluded that this event is cross-cutting in Human Performance, Resources for failure to provide accurate procedures (H.2(c)).

Inspection Report# : [2009002](#) (pdf)

**Significance:** **G** Mar 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **FAILURE OF THE UNIT 2 EMERGENCY DIESEL GENERATOR COOLING WATER PUMP**

A self-revealed finding of very low safety significance (Green) and NCV of 10 CFR 50, Appendix B, Criterion III, Design Control was identified by inspectors when the Unit 2 diesel generator cooling water pump failed on November 12, 2008, due to damage caused by inter-granular stress corrosion cracking (IGSCC). The licensee's staff failed to apply appropriate rigor during the design and procurement process for pump replacement parts resulting in installation of vendor-supplied components that were not suited to the application and operating methodology for the emergency diesel generator cooling water system. The pump was repaired and returned to service the next day. Additionally, the remaining pumps were started to demonstrate that they were functional at the time of Unit 2 pump failure.

The inspectors concluded that the failure to implement measures that assured the equipment was suitable for the process environment was of very low safety significance (Green) because only one pump of three subsystems was degraded to the point where operability and function was affected. Additionally, the licensee process did not validate the vendor's compliance with all procurement specifications, instead assuming that the vendor's communications were complete even though details of wear ring material changes were not included. Inspectors have determined that this behavior is cross-cutting in Human Performance, Decisionmaking, for failure to use conservative assumptions in communications with the vendor and ensuring all of the vendor supplied parts were appropriate to support the pump function (H.1(b)).

Inspection Report# : [2009002](#) (*pdf*)

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## **Barrier Integrity**

**Significance:** **G** Dec 31, 2009

Identified By: Self-Revealing

Item Type: FIN Finding

### **DARLEY PUMP LEAKING GASOLINE FROM THE FUEL PUMP**

A finding of very low safety significance was self-revealed for the failure to perform maintenance that would ensure the pump was in a standby condition and readily available to accomplish the requirements of QCOA 0010-16, "Flood Emergency Procedure." Although the staged portable pump would not have supported the external flooding emergency response procedure, no violation of regulatory requirements occurred. The inspectors did not identify a cross-cutting aspect associated with this finding because the issue is not reflective of current licensee performance. Immediate corrective actions included replacement of the degraded battery and overhaul of the pump's fuel pump. Other actions included identification of preventative maintenance tasks and a program owner of the pump and support equipment.

This issue was more than minor because it was associated with the Structures, Systems, and Component (SSC) Performance attribute of the Barrier Integrity Cornerstone objective of maintaining the functionality of spent fuel pool cooling. The finding affected the cornerstone objective of providing assurance that physical design barriers protect the public from radionuclide releases caused by events including external flooding. Specifically, the pump could fail due to maintenance preventable component failure resulting in inadequate or degraded makeup to the spent fuel pool during an external flooding event. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of findings," Tables 4a and 4b. The inspectors determined that even though this equipment is assumed to completely fail, the licensee could provide an alternate portable pump already located on site and capable of performing the safety function during this slow developing event. Since alternate equipment was available and the delay in mobilizing the alternate equipment would not have resulted in loss of capability to mitigate the impact of the flooding event, the issue is of very low safety significance or Green.

Inspection Report# : [2009005](#) (*pdf*)

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# Emergency Preparedness

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## Occupational Radiation Safety

**Significance:**  Mar 31, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **FAILURE TO COMPLY WITH TECHNICAL SPECIFICATION AND RADIATION WORK PERMIT REQUIREMENTS DURING WORK IN A LOCKED HIGH RADIATION AREA**

A self-revealed finding of very low safety significance and an associated Non Cited Violation (NCV) of Technical Specification 5.7.1 was identified by inspectors for the failure to comply with the requirements of the radiation work permit during work activities in the radwaste basement, an area controlled as a locked high radiation area. Specifically, on January 13, 2009, an equipment operator failed to inform the radiation protection staff prior to access into overhead areas above 7 feet. Consequently, the worker entered areas which had not been surveyed, and, therefore, the radiological conditions were unknown. As a result, the worker encountered radiation levels greater than those anticipated for the work activity. The licensee's corrective actions included counseling of the involved individual and conducting a standdown with the operations department to reinforce radiological requirements along with communication expectations. The licensee was also in the process of completing an apparent cause evaluation to formulate additional actions to prevent recurrence.

The finding was more than minor because it impacted the program and process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation, in that, access into high radiation areas whose radiological conditions were unknown placed the worker at risk for unnecessary radiation exposure. The finding was determined to be of very low safety significance because it was not an as-low-as-is-reasonably-achievable (ALARA) planning issue, there was no overexposure or substantial potential for an overexposure, and the licensee's ability to assess worker dose was not compromised. The finding involved a cross-cutting aspect in the area of Human Performance related to Work Practices, in that, radiation work permit (RWP) compliance for access into overhead areas was not effectively communicated to the worker and the worker failed to follow the RWPs (H.4(b)).

Inspection Report# : [2009002](#) (*pdf*)

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## Public Radiation Safety

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### Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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