

## Quad Cities 1 1Q/2013 Plant Inspection Findings

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### Initiating Events

**Significance:** G Aug 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

#### **CAPR NOT COMPLETED**

A finding of very low safety significance (Green) and associated NCV of 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program" was identified by the inspectors when they determined that a licensee-specified corrective action to prevent recurrence (CAPR) of a significant event was not completed as required by a quality assurance program implementing procedure, LS-AA-125, "Corrective Action Program (CAP) Procedure." Inspectors determined that the failure to complete the CAPR and install auxiliary contactors that had undergone enhanced testing (designated PQI testing in the licensee's documentation) before installation was a performance deficiency entered into the licensee's CAP as IR 1409378. Immediate corrective actions included performing a functional evaluation of installed components and quarantine of remaining spare parts.

This finding was more than minor because the CAPR established criteria that should have prevented installation of the parts until testing was performed, but the parts were installed in the plant and the components were returned to service, thus impacting the reactor safety, initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

Inspectors performed a SDP Phase 1 screening using

IMC 0609 Attachment 4 and Appendix A Exhibit 1, Initiating Events Screening Questions," and answered all of the questions, "No." Therefore, the finding screened as very low safety significance or Green. The inspectors identified that this finding has a cross-cutting aspect in the area of Human Performance – Work Practices, in that, licensee personnel did not follow procedures (H.4(b)). Inspectors determined that the primary contributor to this finding was that procurement personnel did not follow procedure SM-AC-3019, "Parts Quality Process," which stated in Attachment 6 that "the station shall inform the test facility of any unique or special test requirements for the equipment. Otherwise, Exelon PowerLabs will apply standard PQI testing criteria for the item." Procurement personnel did not identify the enhanced PQI testing requirement to PowerLabs when the part was sent for testing.

Inspection Report# : [2012007](#) (*pdf*)

**Significance:** G Jun 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **BUS ENERGIZED WITH GROUNDING DEVICE INSTALLED**

A finding of very low safety significance with an associated NCV of TS 5.4.1.a, "Procedures," was self-revealed on March 24, 2012, when operators energized an electrical bus in the switchyard with a grounding device still installed on that bus. Failure of a transmission maintenance supervisor to implement the requirements of OP-AA-109-101, "Clearance and Tagging," and have operations place a danger tag on a grounding strap installed on 345 kV Bus 9 resulted in a significant voltage perturbation and operating transient on Unit 1. The licensee entered the issue in the CAP as IR 1345302 and immediate actions included clearing the fault and restoring plant equipment. Individual qualifications were removed for parties involved in the event, and a root cause evaluation was performed.

The finding was determined to be more than minor because it impacted the Human Performance attribute of the Initiating Events Cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the Human Performance attribute was challenged because the human error resulted in a voltage transient that produced an operational transient on Unit 1 and could have resulted in a more severe challenge to both units. The inspectors performed a SDP Phase 1 screening for the finding using IMC 0609, Table 4a, for the Initiation Events Transient Initiators and determined that the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The duration of the event, separation of divisional and emergency power supplies, and redundancy of equipment supplying safety functions were considered for this determination. Therefore, the finding screened as Green, or very low safety significance. The inspectors identified that this finding has a cross-cutting aspect in the area of Human Performance - Decision Making because both the station supervisor overseeing the electrical bus realignment and the clearance holder took action based on non-conservative assumptions that could easily have been validated before placing the electrical system at risk (H.1(b)).

Inspection Report# : [2012003](#) (*pdf*)

**Significance:**  Jun 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **FAILURE TO IDENTIFY DESIGN DEFICIENCY IN VENDOR PRODUCT**

A self-revealed finding of very low safety significance with an associated NCV of Technical Specification (TS) 3.7.7, "Main Turbine Bypass Valves System," was identified on April 18, 2012, when an unplanned reactor scram occurred during generator voltage regulator testing. Inspectors subsequently determined the licensee had failed to identify elimination of a time delay that changed how the system responded to a load reject with no turbine trip during vendor design documentation review for the digital electro-hydraulic control (DEHC) system modification implemented in 2006. Failure to perform the review with the rigor required by CC-AA-103-1003, "Owner's Acceptance Review of External Engineering Technical Products," is a performance deficiency entered into the licensee's corrective action program (CAP) as Issue Report (IR) 1355763. This finding resulted in exceeding the allowed out-of-service time for TS 3.7.7, "Main Turbine Bypass System," on at least eleven occasions between the two units since the modifications were installed.

The finding was determined to be more than minor because the performance deficiency adversely affected the Reactor Safety - Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. In this circumstance, the Design Control attribute of the cornerstone was adversely impacted when unintended consequences were introduced during a modification. Using IMC 0609, Attachment 4, Table 4a, Initiating Events Cornerstone, Transient Initiators, inspectors determined that the performance deficiency did not contribute to the likelihood of both a reactor trip and unavailability of mitigation equipment since the main steam safety and relief valves are the credited pressure mitigation equipment and were unaffected by the event. Therefore, this finding screens as Green, or very low safety significance. The inspectors did not identify a cross-cutting aspect for this performance deficiency since it occurred during the DEHC modification review in 2006 and was considered a legacy issue.

Inspection Report# : [2012003](#) (*pdf*)

## Mitigating Systems

**Significance:**  Dec 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **DIESEL GENERATOR TECHNICAL SPECIFICATION FREQUENCY AND VOLTAGE VARIATION NOT CONSIDERED IN LOADING CALCULATIONS**

The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to verify and ensure that operating the emergency diesel generators (EDGs) at the limits of voltage and frequency, allowed by Technical Specification (TS) 3.8.1.2, would not affect the safety related components. Specifically, the license failed to ensure the EDGs, operating under any combination of allowed voltage and frequency, would not be loaded in excess of the licensed limit and would not cause supplied components to become inoperable. The licensee entered the issue into the corrective action program (CAP) as Issue Report (IR) 01288784, "CDBI – Technical Specification Limits for EDG," and restricted EDG operation to near the midpoint of the allowed TS range during any potential event until the licensee demonstrates operability over the full TS range.

The finding was more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design control attribute was adversely affected because the licensee failed to ensure the TS allowed operating band for EDG frequency and voltage could not affect the operability and reliability of mitigating system components. Based on a Phase 3 internal events SDP evaluation performed by a regional senior reactor analyst, the inspectors determined the finding was of very low safety significance (Green). No cross-cutting aspect was assigned since the analysis was last performed in May of 2007 and is not necessarily reflective of current performance.

Inspection Report# : [2012005](#) (*pdf*)

**Significance:**  Dec 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **BOTH UNIT 1 CORE SPRAY SUBSYSTEMS INOPERABLE**

A self-revealed finding of very low safety significance (Green) and an associated NCV of TS 3.5.1.K were identified for two core spray systems inoperable due to degraded flood barriers on August 6, 2012. The failure of the 1B core spray and Unit 2 reactor core isolation cooling/2B core spray floor drain ball valves was caused by wear related degradation that occurred at the valve-to-actuator coupling that allowed the valve to not be fully seated despite the actuator indicating fully closed. Since the surveillance tested the floor drain ball valves in the as-found condition, the condition existed prior to discovery. Therefore, both Unit 1 core spray subsystems were inoperable due to degraded flood barriers. This condition would have required immediate entry into Limiting Condition for Operation 3.0.3 to commence a shutdown within 1 hour. This issue was entered into the licensee's CAP as IR 1397306. Corrective actions for this issue included repairs to the floor drain ball valves, extent of condition inspection of all reactor building floor drain ball valves and shortening the surveillance interval from 4 years to 2 years.

The finding was more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability of systems to respond to initiating events to prevent undesirable consequences. In this case, the Cornerstone attribute of protection against external factors (internal flood) was impacted. The inspectors performed an SDP Phase 1 screening for the finding using IMC 0609, Attachment 04, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and answered the first four questions "No." Therefore, the finding screened as very low safety significance, or Green. The inspectors identified that this issue had a cross-cutting aspect in the area of Problem Identification and Resolution - Identification (P.1(a)). A contributor to this finding was that the Operations and Engineering Departments were aware that the reach rod operators for the floor drain ball valves were difficult to operate. However, an issue report was never entered into the corrective action program to make the organization aware of this issue, assess for proper operation, trend the valve performance, identify potential failure mechanisms, or document conclusions.

Inspection Report# : [2012005](#) (*pdf*)

**Significance:** G Sep 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **UNIT 1 HPCI STEAM LINE DRAIN VALVE THROUGH-BODY LEAK**

A self-revealed finding of very low safety significance (Green) and associated NCV of Technical Specification (TS) 5.4.1.a was identified for the failure to develop a preventative maintenance schedule appropriate to the environmental conditions and potential failure mechanisms for the 1-2301-29 high pressure coolant injection (HPCI) system steam line drain valve. After a through-body leak was identified on the 1 2301 29 valve on July 15, 2012, inspectors determined that although the preventative maintenance template for this valve was supposed to be condition based, the frequency for internal inspection was designated “as required” when the valve was exposed to an erosive environment. Inspectors reviewed the work history for the valve, operating experience, and issue timeline to determine that the performance deficiency was a legacy issue, and no cross-cutting aspect was identified. Based on the licensee’s reaction to more recent operating experience, inspectors determined that the performance deficiency was not indicative of current performance. When presented with operating experience from another facility earlier this year, the licensee recognized the vulnerability and scheduled internal inspections for valves at the next opportunity. Given that the licensee had no indication of degradation at the time and the replacement would require cold shutdown conditions, since both HPCI and reactor core isolation cooling would be unavailable during the repair, the 2013 schedule was reasonable. The licensee replaced the degraded valve and performed limited inspections of associated piping. Additional inspections for similar valves were scheduled.

The performance deficiency was more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems to respond to initiating events to prevent undesirable consequences. In this instance, the licensee later determined through calculation that the HPCI system could have performed its safety mission for a loss of coolant accident. However, inspectors determined that HPCI reliability could be impacted, in that, HPCI would not be available for other risk significant operating events that the system could be utilized to mitigate if the steam leak were not present. The inspectors performed an SDP Phase 1 screening for the finding using IMC 0609, Attachment 04, “Initial Characterization of Findings,” and IMC 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions,” and answered the first four questions “No.” Therefore, the finding screened as very low safety significance, or Green.

Inspection Report# : [2012004](#) (*pdf*)

**Significance:** G Sep 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **CONTROL ROOM HVAC RCU HEAD BOLTS NOT TORQUED**

A self-revealed finding of very low safety significance (Green) and associated NCV of TS 5.4.1.a was identified for the licensee’s failure to specify torque values for the control room ventilation refrigeration condensing unit condenser head in the work instructions performed on January 19, 2012. The inspectors identified that this issue had a cross-cutting aspect in the area of Human Performance - Decision Making (H.1(b)). Inspectors determined that a contributor to this finding was that the Maintenance and Engineering Departments did not verify the assumptions or identify unintended consequences with possible variance in the interpretation and implementation of work instructions stating, “tighten bolts using a crisscross pattern and good mechanical judgment,” vice specifying a torque value from MA-MW-736-600. Although this work practice had been in place for years, mechanics questioned the lack of a torque value during the post leak repair to restore operability. Engineering replied with “mechanical judgment” rather than specifying a torque value indicating that the practice was indicative of current performance. The heat exchanger leak was repaired and the head reassembled with nominal torque values.

The performance deficiency was more than minor because the performance deficiency, if left uncorrected, had the potential to lead to a more significant event. The inspectors performed an SDP Phase 1 screening for the finding using IMC 0609, Attachment 04, “Initial Characterization of Findings,” and IMC 0609, Appendix A, Exhibit 2, “Mitigating

Systems Screening Questions,” and answered the first four questions “No.” Therefore, the finding screened as very low safety significance, or Green.

Inspection Report# : [2012004](#) (pdf)

**Significance:**  Aug 03, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Procedure to Energize Bus 23-1 to Provide Torus Cooling for Unit 1**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix R, Section III.L.3 for the licensee’s failure to have an adequate procedure used to implement an alternative shutdown capability in the event of a fire in fire area TB-III. Specifically, the licensee failed to provide adequate steps to ensure the successful energization of Bus 23-1 from the Unit 2 Station Blackout (SBO) Diesel Generator (DG) in the event of a fire in fire area TB-III (Turbine Building Southern Zone Group). The licensee entered the issue into their corrective action program and added a step to close the Bus 23-1 and Bus 71 Tie Breaker.

The inspectors determined that the finding was more than minor because the procedure deficiency did not ensure the successful energization of Bus 23-1 from the Unit 2 SBO DG in the event of a fire in fire area TB-III, which was required to provide Torus cooling for Unit 1. The finding was screened as having very low safety significance in Task 1.3.1 of IMC 0609, Appendix F. This finding did not have a cross-cutting aspect because the finding was not representative of current performance.

Inspection Report# : [2012011](#) (pdf)

**Significance:**  Aug 03, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Procedure for Cold Shutdown Repair of 1A Recirculation Pump Discharge Valve MO 1-202-5A**

The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix R, Section III.L.5 for the licensee’s failure to have a procedure in effect that would provide adequate cold shutdown repairs for the 1A Recirculation Pump Discharge Valve MO 1-202-5A. Specifically, a procedure deficiency in Quad Cities Annunciator Response Procedure (ARP) 0030-01, Attachment D, provided an incorrect terminal point and cubicle location on MCC 18/19-5 for the cable wire to be lifted for cold shutdown repair in the event of a fire in fire area TB-III. The licensee entered the issue into their corrective action program revised the procedure and corrected the deficiency.

The inspectors determined that the finding was more than minor because the procedure deficiency could have resulted in operational complications and could have delayed reaching cold shutdown in the event of a fire in fire area TB-III. The finding was screened as having very low safety significance in Task 1.3.1 of IMC 0609, Appendix F. This finding did not have a cross-cutting aspect because the finding was not representative of current performance.

Inspection Report# : [2012011](#) (pdf)

**Significance:**  Jun 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**PROCEDURE NONCOMPLIANCE IMPACTING RELIABILITY OF HPCI**

An NRC-identified finding of very low safety significance with an associated NCV of 10 CFR 50, Appendix B,

Criterion V, "Procedures," was identified on March 27, 2012, when station employees did not adhere to station seismic controls while performing Unit 2 outage work. Failure to implement the requirements of the seismic procedure was a performance deficiency. In placing the stacked Unit 2 high pressure coolant injection turbine steam chest too close to the Unit 1 high pressure coolant injection pump and piping, technicians circumvented administrative controls in place to prevent unrestrained equipment from impacting safety-related equipment during a seismic event. The licensee subsequently secured the assembly per the procedure. This issue was entered into the licensee's corrective action program as IR 1358458.

The finding was determined to be more than minor because it adversely affected the equipment reliability attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems responding to initiating events to prevent undesirable consequences (i.e., core damage). This finding was assessed using the Phase 1 screening worksheets of IMC 0609 and determined to be of very low safety significance (Green). The finding did not result in an actual loss of safety function of a single train for greater than the TS allowed outage time. The finding did not involve a total loss of any safety function, as identified by the licensee through a Probabilistic Risk Assessment, Individual Plan Examination of External Events, or similar analysis, contributing to external event-initiated core damage accident sequences (i.e., initiated by a seismic, flooding, or severe weather event). The inspectors identified a cross-cutting aspect in the area of Human Performance - Resources because the licensee did not ensure that the work package included sufficient information to ensure that the cribbing used for the activity met the requirements specified by engineering in the analyzed load movement plan (H.2(c)).

Inspection Report# : [2012003](#) (*pdf*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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## **Public Radiation Safety**

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## **Security**

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

## Miscellaneous

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