

Quad Cities 1

3Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2008

Identified By: NRC

Item Type: FIN Finding

EXPLOSION OF THE FDSgT VESTIBULE.

A self-revealed finding of very low safety significance was identified for inadequate procedures that resulted in an onsite explosion on October 27, 2008. Specifically, operating procedures for the floor drain surge tank did not include appropriate warnings, cautions, or notes to alert operators to potentially hazardous conditions or operating sequences that could result in localized elevated concentrations of methane gas. As a result, waste water transfer activities resulted in an accumulation of methane gas in the floor drain surge tank building vestibule that subsequently ignited, damaging the onsite structure and putting the station in an emergency plan Unusual Event. Corrective actions for the affected tank included purging the tank with nitrogen, repairing the installed tank ventilation, monitoring for methane gas buildup until the tank is cleaned, and processing the waste water stored in the tank. Restrictions on system operation are in place pending final procedure revisions.

The finding is more than minor because if left uncorrected this finding would become a more significant safety concern. In addition, it affected 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. Specifically, the Reactor Safety: Initiating Events Cornerstone attribute of protection against external factors relating to production and control of hazardous gasses. The finding is of very low safety significance (Green) because the finding does not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Additionally, the finding does not increase the likelihood of a fire affecting mitigating systems or a fire of significant duration. Inspectors determined that the finding had a cross-cutting aspect in the area of Problem Identification and Resolution. Specifically, the inspectors determined that the licensee was aware of industry events involving the anaerobic production of methane gas in radwaste systems and had opportunities to incorporate relevant industry operating experience into recent revisions of radwaste operating procedures, but failed to implement this operating experience into station processes, procedures, and training programs for radwaste operations (P.2 (b)). The failure to establish and implement effective radwaste operating procedures to prevent the production of combustible gasses is not an activity affecting quality subject to 10 CFR Part 50, Appendix B, Criterion V. Therefore, while a performance deficiency was identified, no violation of NRC regulatory requirements occurred.

Inspection Report# : [2008005](#) (*pdf*)

Mitigating Systems

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

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 1×10^{-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: FIN Finding

UNIT 1F DRYWELL COOLER IMPROPER RESTORATION FROM MAINTENANCE

A self-revealed finding of very low safety significance was identified by the inspectors for incorrect wiring of the circuit breaker for the 1F drywell cooler following system restoration from a breaker cubicle inspection. The wiring discrepancy was not detected in the post-maintenance testing and resulted in the drywell cooler motor rotating in the wrong direction. This equipment malfunction resulted in a high temperature alarm in the upper area of the Unit 1 drywell. The wiring deficiency was corrected and the 1F drywell cooler was restored to service. Temperatures in the Unit 1 drywell returned to normal.

The inspectors determined that the incorrect wiring of the circuit breaker for the 1F drywell cooler was a performance deficiency and was more than minor because, if left uncorrected, the failure to correctly reinstall wiring could lead to unplanned unavailability of safety-related or risk-significant equipment and would become a more significant safety concern. This performance deficiency also challenged the Mitigating Systems Cornerstone attribute of availability for equipment operated per emergency operating procedures. The inspectors concluded that the issue was of very low safety significance (Green) because the issue involved a single drywell cooler and did not impact the function, reliability or capability of the other six drywell coolers or any other equipment that would be operated per the emergency operating procedures. The inspectors determined that this finding was cross-cutting in the area of Human Performance, Work Practice because inadequate documentation of work activities was a significant contributor to the performance deficiency (H.4(a)).

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

Significance:  Dec 31, 2008

Identified By: NRC

Item Type: FIN Finding

FAILURE TO REMOVE FME DEVICE.

A self-revealed finding of very low safety significance (Green) was identified for failure to remove a foreign material exclusion device from the thrust bearing oil supply line of a feed pump during maintenance on November 3, 2008. The pump was returned to service with increased monitoring following the work activity on November 5 and was shutdown for repair on November 7 after the control room received a bearing high temperature alarm. Immediate corrective actions for the equipment condition included lowering power to get flow within the capacity of two feedwater pumps, shutdown of the 1B pump, removal of the plug, correct reassembly of the oil line, and pump restart. Corrective action following the site investigation included retraining provided to Maintenance staff for documentation requirements and expectations for thorough post-maintenance inspections.

The inspectors determined that failure to remove the foreign material exclusion plug was more than minor because if left uncorrected, this behavior could lead to damage of safety-related or risk-significant equipment and thus become a more significant safety concern. The issue impacted the mitigating systems cornerstone objective of ensuring the availability, reliability and capability of systems that responds to initiating event to prevent undesirable consequences. The finding is of very low safety significance (Green) because the problems with a single feedwater pump did not

impact the function, reliability or capability of the other two and the issue did not affect other mitigating systems. The inspectors determined that this finding was cross-cutting in the area of Human Performance Work Practices in that error prevention techniques such as self/peer checking and proper documentation of activities were not utilized commensurate with the risk of the assigned task (H.4 (a)). Failure to remove the plug in non-safety related equipment is not an activity affecting quality subject to 10 CFR Part 50, Appendix B, Criterion V. Therefore, while a performance deficiency was identified, no violation of NRC regulatory requirements occurred.

Inspection Report# : [2008005](#) (pdf)

Significance:  Oct 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Use of Non-Conservative Inputs and Methodologies in Calculating Terminal Voltages to Safety-Related MOV Motors During Design Basis Events

A finding of very low safety significance (Green) involving a NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified by the inspectors for the failure to evaluate the effect of lower transient voltages that would exist for safety injection actuated motor-operated valves (MOV) prior to voltage recovery on the upstream 4Kv buses. Specifically, the licensee used non-conservative inputs and methodologies in calculating terminal voltages to safety-related MOV motors. The licensee entered the issue into their corrective action program and performed an operability review of all safety injection actuated valves to verify they had sufficient margin to operate when considering transient voltage conditions.

The finding was more than minor because it was similar to IMC 0612, Appendix E, Example 3.j, in that there was a reasonable doubt on the operability of several low pressure coolant injection valves that would have to operate at voltages as low as 60 percent of rating. The inspectors determined the finding was of very low safety significance because it was a design deficiency that did not result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience because the licensee did not adequately evaluate a similar issue in an NRC Information Notice. (P.2(a)).

Inspection Report# : [2008007](#) (pdf)

Significance:  Oct 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Calculations/Analyses and Testing for Thermal Overload Relays (TOLs) on Safety-Related MOVs

A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure that thermal overload relays (TOLs) on safety-related motor-operated valve (MOV) circuits were sized properly and periodically tested. The licensee entered this issue into its corrective action program and was able to demonstrate operability, in that the TOLs would not prevent any MOVs from performing their safety function.

The finding was more than minor because it was similar to IMC 0612, Appendix E, Example 3.j, in that failing to assure that TOLs on safety-related MOV circuits were sized properly and periodically tested led to there being a reasonable doubt as to the operability of the affected safety-related MOVs. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Self-Assessment because the licensee incorrectly evaluated this issue as not being a concern during a self-assessment. (P.3(a)).

Inspection Report# : [2008007](#) (pdf)

Significance:  Oct 24, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Seismic Qualification of 250 VDC Batteries

A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III,

“Design Control,” was identified by the inspectors for the failure to assure that 250VDC safety-related batteries were installed in accordance with their seismic qualification. The licensee entered this nonconformance into its corrective action program and initiated work orders to replace the intercell spacers with properly sized material. To establish a reasonable assurance of operability, the licensee reviewed seismic experience database reports from the Seismic Qualification Utility Group.

The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (spacer replacement) was required to restore seismic qualification. The issue was of very low safety significance because the inspectors determined it was a qualification deficiency that did not result in actual loss of safety function. The inspectors determined there was no cross-cutting aspect associated with this finding.

Inspection Report# : [2008007](#) (pdf)

Significance:  Oct 24, 2008

Identified By: NRC

Item Type: FIN Finding

Inaccurate RCIC Instrument Setpoints

A finding of very low safety significance was identified by the inspectors for failure to accurately implement the design setpoint for reactor core isolation cooling turbine exhaust pressure switches 1(2)-1360-26A/B. The licensee entered this issue into its corrective action program and was able to demonstrate operability by determining that the setpoints would not be challenged for scenarios where reactor core isolation cooling was credited.

The finding was determined to be more than minor because the finding was conceptually similar to IMC 0612, Appendix E, Example 3a, in that rework (instrument recalibration) was required to restore conformance with the design. The issue was of very low safety significance because the inspectors determined it was a design deficiency that did not result in actual loss of safety function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program because the licensee did not adequately evaluate the issue in 2004 such that it was properly classified and prioritized. (P.1(c))

Inspection Report# : [2008007](#) (pdf)

Barrier Integrity

Significance:  Sep 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INOP RCIC PRIMARY CONTAINMENT ISOLATION VALVES

A finding of very low safety significance and an NCV of TS 5.4.1.a were self-revealed for the failure of the Unit 1 reactor core isolation cooling (RCIC) steam exhaust check valve that resulted in a trip of the RCIC system and created a condition where both containment isolation valves in the RCIC steam exhaust line would not have performed their primary containment isolation function. Unit 1 performed a normal shutdown when this condition was identified, and the inboard and outboard primary containment isolation valves were repaired prior to restart.

This finding is more than minor because it challenged the Barrier Integrity Cornerstone attribute for Containment Isolation functionality. The inspectors performed a Phase 1 SDP screening and the IMC 0609, Attachment 4, Table 4a, Containment Barrier questions were all answered, “No.” Therefore the issue screened as Green or very low safety significance. The inspectors determined that this finding did not have a cross-cutting aspect because the licensee’s decision to discontinue periodic inspections of the RCIC steam exhaust check valves in 1996 was not subject to the program review that the licensee currently employs; therefore, this performance deficiency is not indicative of current licensee performance.

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

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE PROCEDURAL ADHERENCE DURING UNIT 1 TIP PM TESTING

A finding of very low safety significance and associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V was self-revealed during the performance of the Unit 1 traversing incore probe (TIP) modification testing on March 27, 2009. During modification testing, the #2 TIP retracted past the shielded position into the reactor building as a result of failure of test personnel to follow the test procedure. The control room received a, "Rx Bldg Hi Radiation" alarm from the local area radiation monitor. Radiation Protection personnel were on scene to evacuate personnel, track dose rates and to set up boundaries to prevent entry. There were no over exposures and no danger to the health and safety of other radiological workers as a result of this event. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Work Practice - Expectations. The test coordinator position did not have a qualification program or documented management expectations for procedure adherence (H.4(b)).

The inspectors determined that the failure of the test coordinator and instrument maintenance technicians to follow an approved procedure, TIC-2306, "Automated TIP Control Unit (ATCU) Modification Test," was a performance deficiency and a finding. This finding was more than minor because if left uncorrected, this performance deficiency has the potential to lead to a more significant safety concern. The inspectors performed a Phase 1 SDP screening. Inspection Manual Chapter 0609, Attachment 4, Table 4a, Mitigating Systems Cornerstone questions were all answered "no." Therefore the issue screened as Green, or very low safety significance.

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

Emergency Preparedness

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)

Public Radiation Safety

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.

Miscellaneous

Last modified : December 10, 2009