Quad Cities 1
4Q/2008 Plant Inspection Findings

Initiating Events

Significance: G 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)*

Significance: G Sep 30, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Inadvertent Initiation of the Unit 1 Feedwater Regulating Valve Fire Protection Deluge
On August 20, a self-revealing finding of very low safety significance and associated Non-Cited Violation (NCV) of Technical Specification (TS) 5.4.1 were identified for an inadequate work instruction for Work Order 00781735-01, “Replace Power Supply for Unit 1 FRV [feedwater regulating valve] Deluge System.” The inspectors determined that the work instructions for the activity did not include instructions to prevent deluge system actuation and led to an unplanned initiation of the Unit 1 feedwater regulating valve deluge system. A lockup of the ‘1B’ feedwater regulating valve resulted due to conflicting control signal inputs. The inspectors determined that there were opportunities in the preparation and execution of the work instruction to prevent an unplanned initiation of the deluge system. Questions were asked by the instrument maintenance technicians in the pre-job brief about the function of the batteries in the fire control panel. The supervisor responded that the batteries supplied alarm backup and memory

power only. The work continued on this response rather than obtaining more complete documentation or additional vendor assistance. The inspectors identified that the lack of rigor to validate system function and identify possible unintended consequences was a contributor to the event. The inspectors determined that the event was cross-cutting in the area of Human Performance, Decision Making, Conservative Assumptions (H.1 (b)). Corrective actions were to isolate the deluge to stop the event and identify and wipe down wet equipment in the area. After verification that the feedwater regulating valve control cabinets were dry, the 'B' feedwater regulating valve was returned to automatic operation. The work to replace the alternating current power supply in the fire protection panel was then reevaluated, instructions corrected, and work completed.

The inspectors determined that the failure to implement appropriate work instructions for changing power supplies in fire protection panels without causing an unplanned initiation of the deluge system is a performance deficiency and is more than minor because it impacts the Initiating Events Cornerstone attribute of procedure quality to limit the likelihood of events that upset plant stability. This event could reasonably be viewed as a precursor to a more significant event. The inspectors performed a Phase 1 SDP evaluation and determined that the answer to Initiating Events Cornerstone, Transient Initiators question 1 of Table 4A of Manual Chapter 0609.04 was "No," and determined that the worst case event would not likely result in mitigation equipment functions being unavailable. The issue is therefore screened as Green, and determined to be of very low safety significance.
Inspection Report# : 2008004 *(pdf)*

Mitigating Systems

Significance: G 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: G 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 (MOVs) 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: G 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: G 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: G 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)*

Significance: G Sep 30, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Assess and Manage Risk Associated with Work on U1 SBO.
NRC inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR 50.65(a) (4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," when the licensee failed to effectively evaluate the risk associated with work on the Unit 1 station blackout (SBO) diesel generator, which resulted in an unplanned risk condition for Unit 1 and Unit 2 without the appropriate risk management actions. Specifically, the Unit 2 SBO diesel generator was determined to be unavailable after inspectors found the oil level in the governor below the indicating sight glass level due to leakage from a loose connection. Concurrently, the Unit 1 SBO diesel generator was unavailable due to planned maintenance. When unavailability of the Unit 2 SBO diesel generator was factored into the on-line risk model with the Unit 1 SBO diesel generator unavailable, the risk profile changed from Green to Yellow. Since the Unit 2 SBO diesel generator was assumed to be available in the original risk evaluation, the underestimation of risk resulted in the station having no risk management actions in place as would have been required by procedure. Those actions include protecting pathways of safety-related equipment that could have a significant impact on the increase in risk, if unavailable. The inspectors also determined that the finding has a cross-cutting aspect in the area of Human Performance, Resources Component, Documentation Aspect because the licensee failed to provide timely and up-to-date procedures to check the engine governor oil sight glass level following the permanent modification to a different governor model that has an oil level sight glass (H.2(c)). Corrective actions included protecting the appropriate equipment and contacting mechanical maintenance to have the fitting tightened and the governor oil sump refilled to the proper level. The Operations Department initiated a process requiring a walkthrough verification of redundant equipment areas before removing equipment from service. Additionally, procedure revisions to operator rounds were made to include verification of sight glass level.

The finding is determined to be more than minor because the finding is based on incorrect assumptions that changed the outcome of the risk assessment and therefore crossed the risk threshold requiring additional actions to manage the risk. The inspectors evaluated this finding using the Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," worksheets of IMC 0609 because the finding is a maintenance risk assessment issue. Flowchart 1, "Assessment of Risk Deficit," requires the inspectors to determine the risk deficit associated with this issue. This finding was determined to be of very low safety significance because the incremental core damage probability deficit was less than 1E 6.
Inspection Report# : 2008004 *(pdf)*

Significance: G Mar 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation

RISK ASSESSMENT OF REACTOR CORE ISOLATION COOLING FLOW CONTROLLER FAILURE
A self-revealing finding of very low safety significance and Non Cited Violation of 10 CFR Part 50.65(a)(4) was identified on January 15, 2008, due to the licensee's failure to properly assess and manage the risk associated with the emergent failure of the Unit 1 reactor core isolation cooling flow controller. The risk assessment incorrectly credited manual local operation of the reactor core isolation cooling for maintaining system availability. The inaccurate risk assessment also resulted in the failure to implement the additional risk management actions required by the licensee's procedures. Corrective actions for this issue included implementation of performance management corrective actions for the procedure usage and training for Work Control and Operating personnel on the risk management procedure.
The inspectors determined that the inadequate risk assessment was more than minor because the elevated plant risk associated with the Unit 1 reactor core isolation cooling system being unavailable would have required the implementation of additional risk management actions (i.e., additional risk significant equipment would have been required to be protected and other maintenance performed on January 15, 2008, would have been rescheduled). The inspectors also reviewed Inspection Manual Chapter 0612, Appendix B, Section 3 and determined that this issue was more than minor because the licensee's risk assessment had known errors which changed the outcome of the assessment. Using input from the licensee's risk assessment engineer, the inspectors determined that the actual risk deficit for this event was less than 1E-6 and the finding was determined to be of very low safety significance. The inspectors determined that this issue was cross-cutting in the area of Human Performance, Work Practices, Procedural Adherence because the individual assessing risk did not follow the procedural guidance for crediting manual operation and for crediting a dedicated (H.4(b)).

Inspection Report# : 2008002 *(pdf)*

Significance: G Mar 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
SAFE SHUTDOWN MAKEUP PUMP LOW DISCHARGE PRESSURE
A self-revealing finding of very low safety significance and a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, was identified on December 17, 2007, for an inadequate pump fill and vent procedure that resulted in pump degradation to the safe shutdown makeup pump. QCOP 2900-01, "Safe Shutdown Makeup Pump System Preparation for Standby Lineup," was used to fill and vent the safe shutdown makeup pump following maintenance and, although the system passed surveillance testing, air was later identified in the system. Air migration within the system was later identified as the cause of safe shutdown makeup pump degradation which resulted in the subsequent failure to meet Technical Specification flow requirements. Corrective actions for this event included the installation of additional vents on the suction piping, an aggressive extent of condition evaluation of other susceptible systems, refurbishment of the safe shutdown makeup pump, briefing personnel on the trending failure, and a review of inservice test alert setpoints to ensure triggers are set appropriately to allow corrective actions to be planned for program components.
The inspectors determined that the failure to provide procedural direction that ensured adequate venting was more than minor because it impacted the Mitigating Systems cornerstone attribute of Equipment Performance and affected the availability and reliability of the system. This finding was determined to be of very low safety significance because although operability of the pump was impacted, the credited safety function was maintained. Contributing to the performance deficiency was that the monitoring program in place was not effective in identifying the gradual degradation before pump operability was impacted. Additionally, the alert threshold for the pump parameter in the monitoring program, which would trigger additional actions such as pump overhaul, was set below the Technical Specification allowable value and was thus an ineffective barrier to prevent loss of operability or function. The inspectors determined this failure to be cross-cutting in the area of Problem Identification and Resolution, Corrective Action Program, Corrective Actions due to the failure of the licensee to address the adverse trend in pump performance in a timely manner, commensurate with the safety significance of the components (P.1(b)).

Inspection Report# : 2008002 *(pdf)*

Significance: G Mar 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation

1/2 "A" DIESEL FIRE PUMP OIL LEAK AND FIRE
A self-revealing finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 was identified due to the failure to establish, implement, and maintain procedures associated with the fire protection program. Work instructions, Work Order 787787-01, performed on the 1/2 “A” diesel fire pump in September 2007 did not specify the thread sealant to be used in the work activity and the mechanics used a material that subsequently resulted in an oil leak and subsequent fire on December 22, 2007, caused by oil-contaminated insulation. Corrective actions included revision of model work orders for the pump to include guidance for using high temperature thread sealant and performance expectations for work planners to include identification of thread sealant for similar tasks. Additionally, maintenance personnel were briefed on the issue of workers failing to identify and/or replace the oil-contaminated insulation pad replacing the turbocharger oil supply hose during a corrective maintenance activity. Inspectors determined the issue was more than minor because the procedural deficiencies were a precursor to an oil leak and subsequent insulation fire that impacted the reliability and availability of the 1/2 “A” fire pump. The finding was determined to be of very low safety significance because the 100% capacity “B” pump was not impacted and the operator actions after removing the combustibles could have made the “A” pump available shortly after the event. The inspectors determined this failure to be cross-cutting in the area of Problem Identification and Resolution, Identification, due to the failure of multiple individuals to investigate the condition of the insulation that was near the oil leak and thereby failing to identify the oil contamination of that insulation in time to prevent the impact to the diesel fire pump (P.1(a)).

Inspection Report# : 2008002 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

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

Significance: N/A Aug 08, 2008
Identified By: NRC
Item Type: FIN Finding
PI&R Assessment

On the basis of the sample selected for review, the team concluded that implementation of the CAP was generally good. The licensee had a low threshold for identifying problems and entering them in the CAP. Items entered into the CAP were screened and prioritized in a timely manner using established criteria; were properly evaluated commensurate with their safety significance; and corrective actions were generally implemented in a timely manner, commensurate with the safety significance. The team noted that the licensee reviewed operating experience for applicability to station activities. Audits and self assessments were determined to be performed at an appropriate level to identify deficiencies. On the basis of licensee self-assessments and interviews conducted during the inspection, workers at the site expressed freedom to raise safety concerns. The team observed that some significant adverse trends in human performance and equipment clearances and tagging were not initially identified and aggressively addressed for effective results. Subsequent efforts were more effective.
Inspection Report# : 2008008 *(pdf)*

Last modified : April 07, 2009