

Quad Cities 2

2Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE FIRE PROTECTION PROCEDURES

A self-revealing finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 was identified on November 10, 2006, due to the failure to establish, implement, and maintain procedures associated with the fire protection program. The failure to implement and maintain these procedures resulted in a fire protection system hydraulic transient and the wetting of an electrical bus which powered risk significant equipment. Corrective actions for this issue included providing improved procedural instructions regarding fire pump relief valve setpoint verifications, fire protection system strainer maintenance, and fire hydrant flushing activities.

This issue was more than minor because the procedural deficiencies were a precursor to a switchgear wetting event which could have resulted in the tripping of risk significant equipment and a reactor scram. This finding was determined to be of very low safety significance because had the risk significant mitigating systems equipment tripped, the remaining mitigating systems would have been sufficient to address a transient with a loss of the power conversion system and the failure of all containment heat removal. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Resources, Documentation because the licensee failed to have complete, accurate and up-to-date procedures governing fire pump relief valve setpoint verifications, fire protection system strainer maintenance, and fire hydrant flushing activities.

Inspection Report# : [2007005](#) (*pdf*)

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CONTROL TRANSIENT COMBUSTIBLES IN THE CABLE SPREADING ROOM

An inspector-identified finding and a Non-Cited Violation of a Quad Cities Nuclear Power Station license condition for fire protection was identified on May 3, 2007, due to the failure to adequately control transient combustible materials in a transient combustible exclusion zone. Specifically, the inspectors discovered two large cardboard boxes and an aerosol spray can that contained methyl alcohol improperly controlled and unattended in the cable spreading room. Corrective actions for this issue included removing the materials from the cable spreading room, providing additional oversight of the transient combustibles control program, and clearly labeling the cable spreading room as a transient combustible exclusion zone.

The inspectors determined that this issue was more than minor because it could be viewed as a precursor to a significant event, i.e., fire impacting multiple pieces of safety-related equipment. Specifically, multiple vertical cable risers were located within the zone of influence for the aerosol can. The inspectors determined that this issue was of very low safety significance based upon the criteria established in Inspection Manual Chapter 0609F, Table 2.9.1, "Risk Significance Based on ?Core Damage Frequency." The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Work Practices, Oversight, in that the licensee did not ensure that supervisory and management oversight of work activities, including contractors, was appropriate such that nuclear safety was supported.

Inspection Report# : [2007004](#) (*pdf*)

Mitigating Systems

Significance:  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:  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)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

INADEQUATE PROCEDURES FOR EXTERNAL FLOODING AND TESTING OF FLOODING PUMP

The inspectors identified a finding of very low safety significance and a Non Cited Violation of Technical Specification 5.4.1 due to the failure to develop adequate surveillance testing and operating procedures for equipment used during an external flooding event. Corrective actions for this issue included revising the current external flooding procedure and developing and implementing a procedure to test a portable pump used as the sole source of makeup water to the spent fuel pool following an external flood.

This issue was more than minor because it involved the equipment performance and procedure quality attributes of the mitigating systems cornerstone and affected the objective of ensuring the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This issue was determined to be of very low safety significance due to the very low probability of an external flood of the magnitude which required use of the portable pump and the amount of additional time available to implement other compensatory measures if needed. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Resources, Documentation because the licensee failed to have complete, accurate and up-to-date procedures to combat an external flooding event.

Inspection Report# : [2007005](#) (*pdf*)

Significance: G Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROMPTLY CORRECT MARCH 2007 1D RESIDUAL HEAT REMOVAL PUMP BREAKER FAILURE

A self-revealing finding and a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, was identified in September 2007 for the failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to assure that the cause of the March 2007 failure of the 1D residual heat removal pump breaker was promptly identified and corrected. This resulted in an additional 1D residual heat removal pump breaker failure in May 2007. Corrective actions for this issue included performing an extent of condition review and modifying all of the Unit 1 Merlin Gerin breakers and cubicles. At the conclusion of the inspection period, 17 of the 47 Unit 2 breaker cubicles had also been modified. The remainder will be modified during the next Unit 2 refueling outage.

This issue was more than minor because, if left uncorrected, the failure of safety-related breakers would continue to result in the inoperability of risk significant equipment. This finding was of very low safety significance because it was not a design deficiency, did not result in the total loss of a safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding was determined to be cross-cutting in the area of Problem Identification and Resolution, Corrective Action Program, Evaluation, because the licensee failed to thoroughly evaluate the March 2007 breaker failure to ensure that the resolution addressed the cause and extent of condition.

Inspection Report# : [2007004](#) (*pdf*)

Significance: SL-IV Sep 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate 10 CFR 50.59 Evaluations for the Main Steam Line Tunnel High Temperature Instrumentation and the Electrohydraulic Control System Pressure Regulator

The inspectors identified a Severity Level IV NCV of 10 CFR 50.59(d)(1) for the licensee's failure to perform an adequate 10 CFR 50.59 evaluation for bypassing a channel of the Main Steam Line (MSL) tunnel high temperature instrumentation and for the failure to perform an adequate 10 CFR 50.59 evaluation for changing the license basis to allow operating the Electrohydraulic Control (EHC) System pressure regulator with only one channel in service. Even though the licensee did not intend to operate the plant permanently with a channel of the MSL tunnel high temperature bypassed or with only one EHC pressure regulator channel, the 10 CFR 50.59 evaluations that were performed allowed it. Because of this, the inspection team could not reasonably determine that these changes would not have required a license amendment, because the bypassing of the MSL tunnel high temperature channel could have resulted in more than a minimal increase in the likelihood of a malfunction of a structure, system, or component important to safety. Additionally, the change to allow operating the EHC System pressure regulator with only one channel in service could have created a possibility of a malfunction of an SSC important to safety with a different result. This issue was entered into the licensee's corrective action program.

Because the issue potentially impacted the NRC's ability to perform its regulatory function, this finding was evaluated

using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine that these 10 CFR 50.59 evaluations would not have ultimately required NRC prior approval. The inspectors evaluated the finding using Inspection Manual Chapter (IMC) 0609, Appendix A, Phase 1 screening for the mitigating systems cornerstone and determined that the finding was of very low safety significance because they were able to answer “no” to the Mitigating Systems screening questions in the Phase 1 Screening Worksheet. Specifically, while the licensee failed to perform an adequate 10 CFR 50.59 evaluation for bypassing a channel of the MSL tunnel high temperature instrumentation and for allowing operation of the EHC System pressure regulator with only one channel in service, the licensee would have been able to perform these same actions under the NRC Part 9900 Technical Guidance for Degraded or Nonconforming Conditions.

Inspection Report# : [2007008](#) (*pdf*)

Significance:  Sep 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Account for Delays in ECCS MOV's Due to Voltage Dips during Load Sequencing

The inspections identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” that was of very low safety significance. Specifically, Motor Operated Valve (MOV) delays caused by voltage dips during load sequencing were not translated into and accounted for in the design basis for the In-Service Testing (IST) stroke time acceptance criteria for the Residual Heat Removal (RHR) system inboard and outboard shutoff valves and two core spray inboard isolation valves. This issue was entered into the licensee’s corrective action program.

The issue was more than minor because it was associated with the Mitigating System Cornerstone attribute of “Design Control,” and affected the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the MOV delays caused by voltage dips during Emergency Core Cooling System (ECCS) load sequencing were not accounted for in the licensee’s design basis. This introduced non-conservativisms in the margins for MOV IST acceptance criteria and also potentially for the acceptance criteria themselves. This finding was of very low safety significance, because the inspectors answered “no” to all five questions under the Mitigating Systems Cornerstone column of the Phase 1 worksheet. Specifically, even though the MOV delays were non-conservative, the actual MOV stroke times during the most recent IST testing for the valves in question were much less than the IST acceptance criteria

Inspection Report# : [2007008](#) (*pdf*)

Barrier Integrity

Significance:  Jun 30, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Exceeded 50 Degree Differential Temperature Limit of TS 3.4.9 when starting Recirculation Pump

A Non-Cited violation of Technical Specification 3.4.9, “RCS Pressure and Temperature (P/T) Limits,” was identified on March 31, 2008 when operators did not establish effective controls to ensure compliance with the Technical specification when they started the 2A reactor coolant recirculation pump with temperature in the 2A loop more than 50°F below the bulk temperature in the reactor vessel represented by the 2B loop temperature. The failure to implement effective controls to prevent exceeding the Technical Specification limit was more than minor because it was associated with the Barrier Integrity Cornerstone attribute of Human Performance and affected the cornerstone objective by challenging the physical design barriers intended to maintain the functionality of the Reactor Coolant System. This finding was determined to be of very low safety significance because the plant conditions were determined to be within the bounds of the existing analysis and therefore the issue did not result in degrading the reactor coolant system boundary. This finding has a cross-cutting aspect in the area of Human Performance for the Decision-Making component because the licensee failed to communicate the decisions and the basis for decisions to personnel who have a need to know the information in order to perform work safely, in a timely manner (H.1(c)). Specifically, planning decisions such as the compensatory actions for prompt restoration made during the dayshift for this repair were not effectively communicated to those individuals that were called upon to implement the plan in a safe and timely manner.

Significance:  Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

UNIT 2 ISOLATION OF REACTOR BUILDING VENTILATION AND AUTO START OF STANDBY GAS TREATMENT

A self-revealing finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 was identified on March 14, 2008, when operators transferring power using procedure QCOP 6800-03, "Essential Service System," caused an unplanned isolation of the reactor building ventilation system and automatically started the standby gas treatment system. QOP 6800-03, "Essential Service System," implements the Technical Specification 5.4.1 as provided in Regulatory Guide 1.33. Procedural steps in QOP 6800-03 did not include adequate instruction to transfer power without impacting the safety systems in that the procedural instructions directed the operators to take the bypass switch for radiation instruments out of the bypass position, but did not direct them to verify that there was no isolation signal present. Corrective actions included revising the affected procedure and briefing operating crews on the circumstances surrounding the event.

The failure to implement adequate procedural directions for transferring electrical power without challenging safety-related equipment was more than minor because it impacts the Barrier Integrity cornerstone attribute of Structures, Systems and Components and Barrier Performance for Containment Isolation Structures, Systems, and Components reliability and, if the condition were to go uncorrected, the Containment isolation function could be impacted. This finding was determined to be of very low safety significance because the finding impacted only the radiological barrier function of the control room and standby gas treatment systems, and the systems functioned as designed. The inspectors also determined that the operators implementing the procedure had the opportunity to identify the procedural deficiency either during the job preparation activities or while executing the procedural steps if they had verified the trip signals were cleared prior to moving the switch. Properly executed self-checking and peer-checking would have identified the possible action and provided the operators with the opportunity to prevent the challenge to the safety-related system components. The inspectors identified the deficient use of Human Performance tools as a contributor to the event and therefore determined that the event was cross-cutting in Human Performance, Work Practices, Prevention (H.4(a)).

Significance:  Sep 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO FOLLOW PROCEDURES AND USE HUMAN PERFORMANCE TOOLS RESULTS IN REACTOR BUILDING VENTILATION ISOLATION

A self-revealing finding and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, was identified on September 8, 2007, due to the failure to follow procedures during the performance of Unit 1 125 Vdc ground detection activities. The failure to follow procedures resulted in the inadvertent isolation of the Unit 2 reactor building ventilation system. Corrective actions for this issue included restoring the isolated plant equipment, briefing personnel on the event, revising the ground detection procedure to ensure consistency with other Exelon stations, requiring additional oversight of ground detection activities, and implementing additional human performance improvement initiatives.

The inspectors determined that this issue was more than minor because if left uncorrected, it would lead to additional equipment issues. The inspectors determined that this issue was of very low safety significance because it did not represent a degradation of a radiological barrier provided by the standby gas treatment system, did not represent a degradation of the barrier function of the control room ventilation system against smoke or a toxic atmosphere, and did not represent an actual open pathway in the physical integrity of the reactor containment. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Work Practices, Human Error Prevention because the licensee's human error prevention techniques were not used to ensure that the work activity was performed safely.

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

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