

Quad Cities 2

1Q/2003 Plant Inspection Findings

Initiating Events

Significance:  Dec 28, 2002

Identified By: Self Disclosing

Item Type: FIN Finding

INADEQUATE PROCEDURE AND SELF CHECKING RESULTS IN CONNECTING AIR POWERED VACUUM TO INSTRUMENT AIR SYSTEM AND TWO AIR TRANSIENTS

The failure to identify the proper plant air supply prior to installing moisture separator decontamination equipment (air powered vacuum) resulted in two unexpected instrument air system transients on October 14 and 15, 2002. The work package did not contain equipment identification numbers to aid in identifying the proper air supply. In addition, the individual instructed to identify the air supply failed to perform self-checking activities that could have identified the inappropriate selection of instrument air for the equipment installation rather than service air. This finding was more than minor because it affected the loss of instrument air initiating event frequency. The finding was of very low safety significance because the exposure time was short and all mitigating systems needed to address a loss of instrument air were available. No violation of NRC requirements occurred due to the instrument air system being non-safety-related. Inspection Report# : [2002008\(pdf\)](#)

Significance:  Dec 20, 2002

Identified By: NRC

Item Type: FIN Finding

Failure to Recognize and Address High Vibration Indications on Plant Equipment

Green. The inspectors identified a Green finding due to the licensee's failure to recognize and address high vibration indications on plant equipment. On April 2, 2002, a Unit 2 main steam drain line broke due to high vibrations. The pipe break occurred down stream of the main steam isolation valves in a non-safety-related portion of the main steam piping. The issue was more than minor, in that if the vibrations were not corrected (on both units) they could become a more significant safety concern. However, due to the location of the actual break, the issue was determined to be of very low safety significance. This issue was not subject to NRC enforcement since the break occurred in a non-safety-related portion of the main steam line and did not impact the operation of safety-related equipment (Section 40A2.1.b1).

Inspection Report# : [2003002\(pdf\)](#)

Significance:  Sep 30, 2002

Identified By: Self Disclosing

Item Type: FIN Finding

UNEXPECTED CHANGES IN UNIT 2 OPERATING PARAMETERS AND DRYER FAILURE DUE TO FLOW INDUCED VIBRATION.

The failure to consider the impact of new flow induced vibration failure mechanisms on the Unit 2 steam dryer as part of the extended power uprate analysis resulted in unexpected and unpredictable changes in reactor power, reactor vessel level, reactor pressure, and main steam line flow between June 7 and July 11, 2002. The licensee subsequently determined that the changes in Unit 2 operating parameters were caused by the failure of a Unit 2 steam dryer cover

plate. This finding was more than minor because the changes in Unit 2 operating parameters caused by the degraded dryer created conditions which increased the likelihood of a plant transient. However, this finding was of very low risk significance because the changes in plant parameters and the dryer failure did not contribute to the likelihood of a primary or secondary loss of coolant accident initiator, did not contribute to the likelihood of a reactor trip with mitigating equipment not available, and did not increase the likelihood of a fire or an internal or external flood. There were no violations of NRC requirements due to the steam dryer being non-safety related.

Inspection Report# : [2002007\(pdf\)](#)

Significance:  Jun 30, 2002

Identified By: Self Disclosing

Item Type: FIN Finding

INADEQUATE DIGITAL FEEDWATER SYSTEM DESIGN AND INADVERTENT GROUNDING OF PLANT EQUIPMENT RESULTS IN REACTOR SCRAM

A digital feedwater control system design weakness, in conjunction with the inadvertent grounding of a pressure transmitter during an instrument maintenance surveillance, resulted in a manual reactor scram due to increasing reactor vessel water level. The inspectors determined that this issue was of very low safety significance because the feedwater system would have been recoverable following a Level 8 isolation signal, and adequate mitigating systems equipment remained available to place and maintain the plant in a stable condition.

Inspection Report# : [2002005\(pdf\)](#)

Significance:  Jun 30, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PARTICIPATE IN TURNOVER CONTRIBUTES TO MANUAL REACTOR HEAD VENT ISOLATION VALVES BEING LEFT OPEN DURING UNIT STARTUP

A lack of communications between operations personnel and an administrative senior reactor operator's failure to participate in a formal shift turnover resulted in operations personnel commencing a Unit 2 reactor startup with the manual reactor head vent isolation valves in the open position. The failure to participate in a turnover was considered a Non-Cited Violation of Technical Specification 5.4.1. The inspectors determined that this issue was of very low safety significance because the leak created by the open manual reactor head vent isolation valves was small, and adequate mitigating equipment was available to respond to a potential transient condition.

Inspection Report# : [2002005\(pdf\)](#)

Mitigating Systems

Significance:  Mar 31, 2003

Identified By: NRC

Item Type: FIN Finding

UNIT 2 REACTOR CORE ISOLATION COOLING RENDERED INOPERABLE DURING SCAFFOLD DISASSEMBLY

The inspectors identified a finding involving a human performance error that resulted in the loss of the safety function of the Unit 2 reactor core isolation cooling system. An individual inadvertently bumped the system's trip throttle mechanism while removing scaffolding from the area. The inspectors determined that the finding was more than minor because it impacted the mitigating systems attributes and objectives. In particular, the finding affected the availability,

reliability, and capability of the reactor core isolation cooling system, a system that responds to initiating events to prevent undesirable consequences. The finding was of very low safety significance based on the low probability of core damage for the analyzed sequences.

Inspection Report# : [2003003\(pdf\)](#)

Significance:  Mar 31, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MAINTAIN ADEQUATE SPATIAL SEPARATION OF FLAMMABLES FROM THE DIESEL DRIVEN FIRE PUMPS

The inspectors identified a finding involving a Non-Cited Violation for the licensee's failure to maintain 80 feet of spatial separation between a flammable liquids storage cabinet and the furthest diesel fire pump as required by the Quad Cities Operating Licenses and the Fire Protection Program. The inspectors concluded that this finding was more than minor because the improper cabinet placement and potential storage of a large amount of flammable materials could lead to a fire which could engulf both fire pumps and cause a loss of the non safety-related service water system and the circulating water system. In addition, this finding was associated with the initiating events cornerstone attribute of protecting the plant against external factors and impacted the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions. The finding was of very low safety significance based on the determination that the actual stored flammable liquids, if inadvertently ignited, would not produce sufficient radiative heat flux to damage both fire pumps at the same time.

Inspection Report# : [2003003\(pdf\)](#)

Significance:  Mar 31, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROPERLY LATCH FUSE DRAWERS CAUSING AUTOMATIC INITIATION AND LOADING OF EMERGENCY DIESEL GENERATOR

The inspectors identified a finding involving a Non-Cited Violation on Unit 1 for the failure to properly latch the potential transformer fuse drawers for bus 14 and bus 14-1. This resulted in the fuse drawers dropping open and causing the automatic initiation and loading of the emergency diesel generator due to loss of voltage on the emergency bus. Multiple operations department procedures failed to contain instructions to ensure that the potential transformer fuse drawers for the safety-related busses were properly latched. Unit 1 was unknowingly vulnerable to a loss of voltage condition on two safety-related busses during a seismic event. The finding was more than minor because it was associated with attributes in both the mitigating systems and initiating events cornerstones and also affected each cornerstone objective. For example, a seismic event could cause both drawers to open resulting in a loss of both busses; a scram, and the loss of two residual heat removal service water pumps. The finding was of very low safety significance primarily due to the low initiating event frequency associated with a seismically induced loss of offsite power.

Inspection Report# : [2003003\(pdf\)](#)

Significance:  Mar 31, 2003

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO RESET PRIMARY CONTAINMENT ISOLATION LOGIC CAUSING RHR LPCI INOPERABILITY

The inspectors identified a finding on Unit 2 involving a Non-Cited Violation for the failure to reset the primary containment isolation logic after testing the low pressure coolant injection valves which caused the inoperability of

both residual heat removal loops for more than 18 days. The inspectors determined that the failure to reset the isolation logic after testing was more than minor because it involved the configuration control, equipment performance, and human performance attributes of the mitigating systems cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance based on the operators' abilities to recover the system during accident conditions, if required for injection, and the low probability of core damage for the analyzed sequences. Inspection Report# : [2003003\(pdf\)](#)

Significance:  Dec 28, 2002

Identified By: Self Disclosing

Item Type: FIN Finding

INADEQUATE DESIGN LEADS TO DELAY IN DISCOVERING SAFE SHUTDOWN MAKEUP PUMP WAS INOPERABLE DUE TO STRAINER CLOGGING

A self-revealing failure occurred on October 16, 2002, when the safe shutdown makeup pump room cooler strainer became clogged with duck weed. The inspectors determined that twice per shift rounds to verify strainer operability and multiple strainer cleanings were not effective in ensuring continued operability of this equipment. In addition, control room personnel were not immediately notified of the clogged strainer via a control room alarm or a local alarm due to a system design deficiency. This finding was more than minor because the strainer clogging impacted the operability of the safe shutdown makeup pump which can be used when responding to initiating events. In addition, the system design issues created a situation where operations personnel were unaware of equipment operability issues. This finding was of very low safety significance because the total exposure time was short, all other mitigating systems were available, and the safe shutdown makeup pump could have been recovered if needed. No violation of NRC requirements occurred due to the safe shutdown makeup only being of augmented quality per the licensee's Quality Assurance Report.

Inspection Report# : [2002008\(pdf\)](#)

Significance:  Dec 28, 2002

Identified By: Self Disclosing

Item Type: FIN Finding

INADEQUATE PROCEDURE AND COMMUNICATION WEAKNESSES LEADS TO EMERGENCY DIESEL GENERATOR INOPERABILITY

During the 1A stator water heat exchanger tube bundle replacement on November 11, 2002, approximately 200 gallons of water were released as the tube bundle was pulled from the heat exchanger. The water migrated to the Unit 1 emergency diesel generator room below and tripped the circulating oil pump and turbocharger lubricating oil pump rendering the diesel inoperable. The work package used to perform the work did not contain information regarding the large amounts of water that may be present in the heat exchanger. In addition, information regarding the amount of water present in the heat exchanger was not communicated to the contractors performing the work even though this information was well known by operations and maintenance personnel. This finding was more than minor because the inadequate work instructions and poor communications resulted in a situation which impacted the operability, availability, and reliability of the emergency diesel generator. The finding was of very low safety significance since the loss of the emergency diesel generator did not result in an actual loss of safety function of a system and did not result in an actual loss of safety function of a single train for greater than the Technical Specification Allowed Outage Time. No violations of NRC requirements were identified due to the stator water heat exchanger being non-safety-related.

Inspection Report# : [2002008\(pdf\)](#)

Significance:  Dec 28, 2002

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

HUMAN PERFORMANCE AND PROBLEM IDENTIFICATION AND RESOLUTION RESULTS IN FAILURE TO DISCOVER IMPACT OF LOOSE LEAD ON RESIDUAL HEAT REMOVAL INOPERABILITY

A loose wire caused a condition that would have resulted in the failure of the 2B residual heat removal system to automatically start when required and would have resulted in the diversion of water from the 2A residual heat removal system if an emergency core cooling system actuation signal was received while the 2B residual heat removal system was operating in torus cooling. One Non-Cited Violation of Technical Specification 3.5.1 was identified. The licensee determined that the wire was loosened during the February 2002 refueling outage. The impact of the loose wire was not addressed until October 2002 even though unexpected equipment performance was experienced on three previous occasions. This finding was more than minor since the loose wire impacted the operability, availability, reliability, and capability of the residual heat removal system. The finding was determined to be of very low risk significance since the both trains of the residual heat removal system were recoverable using simple operator actions and all remaining mitigating systems equipment were available.

Inspection Report# : [2002008\(pdf\)](#)

G

Significance: Dec 20, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," Related to the Quality of Design Basis Engineering Calculations

Green. The inspectors identified a Green Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," related to the quality of design basis engineering calculations. Specifically, the inspectors identified that instrument and test uncertainty was not considered in a number of design calculations, such that the calculation acceptance limits could not be validated. The diesel generator cooling water (DGCW), high pressure coolant injection (HPCI), and reactor core isolation cooling (RCIC) system design bases were not being adequately controlled by existing calculations. This finding was considered greater than minor because a loss of design control could affect the reliability of the DGCW, HPCI and RCIC systems to perform their safety functions. Because no operability concerns were identified, the issue was determined to be of very low safety significance (Section).

Inspection Report# : [2003002\(pdf\)](#)

G

Significance: Sep 30, 2002

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO HAVE APPROPRIATE BEARING FIT-UP AND MOTOR LUBRICATION INSTRUCTIONS

Inadequate bearing fit-up measurement and motor lubrication instructions resulted in a self-revealing failure of the 1A core spray and reactor core isolation cooling room cooler fan inboard motor bearings and a Non-Cited Violation of Technical Specification 5.4.1. The inspectors determined that this finding was more than minor because the improper bearing fit-up and lubrication instructions impacted the availability, reliability, and capability of equipment used to support risk significant mitigating equipment. The failure of the 1A core spray and reactor core isolation cooling room cooler was of low risk significance because the failure was not caused by a design or qualification deficiency, did not result in an actual loss of safety function for the core spray or reactor core isolation cooling systems, and did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event.

Inspection Report# : [2002007\(pdf\)](#)

G

Significance: Sep 30, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO ADEQUATELY CORRECT MULTIPLE FAILURES OF THE 2A RHR
NORMAL/ALTERNATE SWITCH**

Ineffective corrective actions resulted in repetitive failures of the 2A residual heat removal normal/alternate switch between June 1999 and September 2002 and a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI. The failure to correct the multiple normal/alternate switch failures was more than minor because the switch failures impacted the availability, reliability, and capability of equipment used to respond to initiating events and prevent undesirable consequences from a plant fire. This finding was of very low risk significance because the switch failures did not result in an actual loss of function for the residual heat removal system. The switch failures also failed to screen as a risk significant fire issue because the room cooler was not needed until 52 hours after a fire which provided the licensee adequate time to correct the failure.

Inspection Report# : [2002007\(pdf\)](#)

Significance:  Sep 30, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO DOCUMENT AN OVERGREASING ISSUE IN THE CORRECTIVE ACTION PROGRAM
AND TAKE ACTION TO ADDRESS THE EXTENT OF CONDITION**

The licensee failed to follow procedural requirements regarding the initiation of condition reports and determining the extent of condition following the discovery of a large amount of grease in the 1A core spray room cooler motor. As a result, the licensee did not provide a basis for continued operability of potentially impacted plant motors for approximately 40 days. This finding was more than minor because the licensee's lack of action resulted in the inability to ensure the availability and reliability of mitigating systems equipment used to respond to initiating events and prevent undesirable consequences. The inspectors determined that this finding was of very low risk significance because subsequent reviews determined that even if the motors susceptible to overgreasing failed, the motors are not credited in the licensee's probabilistic risk assessment.

Inspection Report# : [2002007\(pdf\)](#)

Significance:  Jun 30, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO PERFORM REQUIRED PARTS EVALUATION FOR CONTROL ROD DRIVE
ACCUMULATOR CLAMPS**

The inspectors identified a design deficiency and a Non-Cited Violation in that licensee personnel failed to perform a parts evaluation when installing hose clamps on the control rod drive system hydraulic accumulators instead of the seismically-qualified steel band clamps. This issue was of very low safety significance because the design deficiency did not result in a loss of function as described in Generic Letter 91-18, "Resolution of Degraded and Non-Conforming Conditions and on Operability."

Inspection Report# : [2002005\(pdf\)](#)

Significance:  Jun 30, 2002

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO MEET 10 CFR 50.62 DUE TO RELIEF VALVES LIFTING

The inspectors documented a Non-Cited Violation of 10 CFR 50.62, "Anticipated Transient Without Scram Rule," due to the potential to lift the standby liquid control system relief valves during an anticipated transient without scram. The inspectors determined that this finding was of very low safety significance because the standby liquid control system

could be recovered during an anticipated transient without scram event, the cycling of the relief valves would allow a portion of the sodium pentaborate solution to be injected into the reactor vessel, and the plant remained within the acceptance criteria of the original anticipated transient without scram analyses during the relief valve lifts.

Inspection Report# : [2002005\(pdf\)](#)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Miscellaneous

Significance: N/A Dec 20, 2002

Identified By: NRC

Item Type: FIN Finding

Corrective Action Program Generally Effective in Ensuring that Conditions Adverse to Quality were Being Adequately Addressed

Although issues were generally entered into the corrective action process at an appropriate level, there were times when opportunities to identify issues were missed due to a narrow focus. This led to issues either being self-revealing or being identified by outside organizations. Several of these issues resulted in plant shutdowns. Minor issues were generally properly categorized and evaluated. However, there were a number of examples where it appeared that the initial evaluation was limited and narrowly focused. These examples tended to be non-routine and involved multiple organizations and layers of management. In general, the licensee effectively corrected plant problems. On the positive side, the inspectors noted that Nuclear Oversight appeared to be an effective source for identifying performance issues and that plant employees, in general, indicated a strong willingness to report problems "to the highest levels." The inspectors concluded that corrective action program was generally effective in ensuring that conditions adverse to quality were being adequately addressed

Inspection Report# : [2003002\(pdf\)](#)

Last modified : May 30, 2003