

Arkansas Nuclear 2

4Q/2004 Plant Inspection Findings

Initiating Events

Significance:  Sep 23, 2004

Identified By: Self Disclosing

Item Type: FIN Finding

INADEQUATE MAINTENANCE PROCEDURE FOR THE MAIN GENERATOR REVERSE POWER RELAYS

A self-revealing finding associated with an inadequate maintenance procedure occurred when the Unit 2 main generator reverse power relays contributed to a turbine trip and a reactor trip. The licensee had not incorporated vendor recommended maintenance on the reverse power relays, and as a result, one of the reverse power relays actuated with no reverse power condition present. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-2-2002-2173.

The finding is more than minor because it was analogous to Example 4.b. in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because a procedural error contributed to a reactor trip. This finding affected the initiating events cornerstone. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding is of very low safety significance because, although it resulted in a reactor trip, all mitigating systems remained available.

Inspection Report# : [2004004\(pdf\)](#)

Mitigating Systems

Significance: TBD Dec 31, 2004

Identified By: NRC

Item Type: AV Apparent Violation

TWO EXAMPLES OF FAILURE TO CONDUCT POSTMAINTENANCE TESTING ASSOCIATED WITH A CONTAINMENT COOLER FAN

Two examples of self-revealing noncited violations of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred when postmaintenance testing for Unit 2 Containment Cooler Fan 2VSF-B and Flow Switch 2FS-8207-1B was not performed after maintenance on these components. This resulted in the failure to detect the fact that these components were inoperable. This issue involved human performance crosscutting aspects associated with electrical maintenance personnel improperly wiring the containment cooling fan and outage management improperly deferring fan flow switch maintenance from the outage. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as CR ANO-2004-0688.

The examples of this finding are more than minor because they are analogous to Example 5.b of Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because Containment Cooling Fan 2VSF-1B and Flow Switch 2FS-8207-1B were returned to service in inoperable conditions. Using Appendix A, "Technical Basis For At Power Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and the Phase 2 worksheets from "Risk-informed Inspection Notebook for Arkansas Nuclear One - Unit 2," the finding was determined to have very low safety significance because all other containment coolers remained operable and containment coolers are not a large mitigator of a large early release.

Inspection Report# : [2004005\(pdf\)](#)

Significance:  Dec 31, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO INCLUDE NONSAFETY RELATED COMPONENTS THAT AFFECT SAFETY-RELATED FUNCTIONS INTO THE MAINTENANCE RULE PROGRAM

A self-revealing noncited violation of 10 CFR 50.65(b)(2) was identified when the licensee failed to include the Unit 2 startup and blowdown demineralizer pressure relief valves in their maintenance rule program. These valves are nonsafety related however, their failure could prevent the safety-related emergency feedwater system from performing its function during accidents occurring during plant startups and shutdowns. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as CR ANO-2-2004-1743.

The inspectors determined that the finding is more than minor because, if left uncorrected, the finding would become a more significant safety concern since failure of these valves could result in an over pressure condition on the emergency feedwater pumps common suction piping.

Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the inspectors considered this finding to have very low safety significance because it did not screen as risk significant due to external initiating events and, even though periodic preventative maintenance has not been performed on the relief valves, they have prevented emergency feedwater pumps suction piping from exceeding design values

Inspection Report# : [2004005\(pdf\)](#)

Significance: TBD Dec 31, 2004

Identified By: NRC

Item Type: AV Apparent Violation

CONTAINMENT COOLER FAN INOPERABLE IN EXCESS OF TECHNICAL SPECIFICATION ALLOWED OUTAGE TIME

A self-revealing noncited violation of Unit 2 Technical Specification 3.6.2.3, "Containment Cooling System," occurred since the Unit 2 Containment Cooler 2VSF-1B was inoperable in excess of its specified allowed outage time. The containment cooler was out of service for over 11 months before the licensee discovered that the fan motor had been improperly wired. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as CR ANO-1-2004-1688. This issue involved problem identification and resolution (PI&R) crosscutting aspects associated with engineers not adequately questioning indications of abnormal containment cooling system operation and performing poor operability evaluations.

This finding is more than minor because it affected the mitigating systems cornerstone objective of ensuring the availability and reliability of a system that responds to initiating events to prevent undesirable consequences. Using Appendix A, "Technical Basis For At Power Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and the Phase 2 worksheets from "Risk-informed Inspection Notebook for Arkansas Nuclear One - Unit 2," the finding was determined to have very low safety significance because all other containment coolers remained operable and containment coolers are not a large mitigator of a large early release.

Inspection Report# : [2004005\(pdf\)](#)

G

Significance: Dec 31, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ESTABLISH ADEQUATE MEASURES TO DEMONSTRATE THE PERFORMANCE OR CONDITION OF THE UNIT 2 PRESSURIZER PROPORTIONAL HEATERS

The inspectors identified a noncited violation of 10 CFR 50.65(a)(2) for failure to establish adequate measures to demonstrate that the performance of the Unit 2 pressurizer proportional heaters was effectively monitored in the maintenance rule program. Failures of the heater breakers were not being monitored as part of the reactor coolant system or the 480 volt electrical system in the licensee's maintenance rule program. The inspectors identified human performance cross-cutting aspects associated with engineers not identifying events that should have been entered in the maintenance rule database.

The inspectors determined that this finding is greater than minor because it is analogous to Example 1.i of Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the licensee's equipment performance problems were such that an (a)(2) demonstration could not be justified. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the issue was determined to have very low safety significance because it did not screen as risk significant due to external initiating events and because the licensee always maintained the minimum required amount of heater input from both trains of pressurizer heaters.

Inspection Report# : [2004005\(pdf\)](#)

G

Significance: Dec 31, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO IDENTIFY AND CORRECT A LOOSE CIRCUIT CONNECTION IN CONTAINMENT SPRAY PUMP CIRCUITRY

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," for the failure to establish controls to prevent a circuit breaker with a loose connection from being installed in Unit 2. A loose connection in the Containment Spray Pump 2P-35A breaker was not identified prior to installation in the plant even though there were several undocumented instances where similar loose connections were discovered during receipt inspections of other breakers in its group. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as CR ANO-2-2004-1712.

The finding is more than minor because it affected the mitigating systems cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using Appendix A, "Technical Basis For At Power Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and the Phase 2 worksheets from "Risk-informed Inspection Notebook for Arkansas Nuclear One - Unit 2," the finding was determined to potentially have greater than very low safety significance because the loose connection could have resulted in an actual loss of the safety function of the Unit 2 Train A containment spray pump during small break loss of coolant accident or stuck open relief valve events. Further examination in a Phase 3 analysis by regional senior risk analysts demonstrated that this finding is of very low safety significance because the fault was highly intermittent and, even if the pump would not have started, it could have been easily started locally.

Inspection Report# : [2004005\(pdf\)](#)

G**Significance:** Sep 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ADEQUATELY ASSESS RISK DUE TO EXTERNAL CONDITIONS OR HELB DOORS REMOVED

The inspectors identified two examples of a noncited violation of 10 CFR 50.65(a)(4) for the failure to consider the external risk from changing weather conditions (tornado warning) while a Unit 2 emergency diesel generator was out of service for maintenance and the failure to perform an adequate risk assessment of the removal of a high energy line break barrier between the turbine building and the Unit 1 South switchgear room. This finding involved problem identification and resolution crosscutting aspects associated with operations and engineering personnel not implementing corrective actions to address the extent of condition from a previous noncited violation documented in NRC Inspection Report 05000313/2004003. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Reports ANO-C-2004-1279 and ANO-C-2004-1402.

The inspectors determined that these issues are more than minor because, if left uncorrected, they would become a more significant safety concern in that actions to manage increases in risk may not be implemented. This finding affected the mitigating systems cornerstone. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the example involving changing weather conditions was determined to have very low safety significance because the finding did not result in a loss of function per Generic Letter 91-18, Revision 1, "Information to Licensee's Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions." Next, using Appendix A, "Technical Basis For At Power Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," and the Phase 2 worksheets from "Risk-informed Inspection Notebook for Arkansas Nuclear One - Unit 1," the finding involving the high energy line break barrier was determined to be of very low safety significance because the only affected initiator was a main steam line break and a redundant train of safety related switchgear always remained available during the short exposure time for the condition.

Inspection Report# : [2004004\(pdf\)](#)**G****Significance:** Sep 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM REQUIRED HYDROSTATIC TESTING OF PRESSURIZED FIRE EXTINGUISHERS

The inspectors identified a noncited violation of Unit 2 operating license Condition 2.C.(3)(b), "Fire Protection," for the failure to perform hydrostatic testing on approximately 80 to 90 percent of the carbon dioxide fire extinguishers. The licensee failed to implement a plan to ensure carbon dioxide fire extinguishers would not exceed their hydrostatic retest expiration dates in response to NRC Information Notice 2001-004, "Neglected Fire Extinguisher Maintenance Causes Fatality." This issue involved problem identification and resolution crosscutting aspects associated with fire protection technicians failing to correct adverse conditions in a timely manner. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-1-2004-1544.

This finding is more than minor because, if left uncorrected, it would become a more significant safety concern in that internal degradation of the fire extinguishers could continue without any means of detection until the extinguishers were unable to perform their intended functions. Using Appendix F, "Determining Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings," of Manual Chapter 0609, "Significance Determination Process," the inspectors determined the issue is of very low safety significance because the fire protection element's performance and reliability was minimally impacted.

Inspection Report# : [2004004\(pdf\)](#)**G****Significance:** Jun 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ADEQUATELY ASSESS RISK DUE TO EXTERNAL CONDITIONS

The inspectors identified a noncited violation of 10 CFR 50.65(a)(4) for the failure to perform adequate risk assessments on Units 1 and 2. The licensee failed to update a prior risk assessment due to changing external events (declaration of a tornado watch) that could have had an impact on the existing assessment (increased likelihood of grid instability). In addition, the licensee did not include the added external risk from fire and its impact on safe shutdown equipment in aggregate risk assessments for the plant. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program.

The inspectors determined that these issues are more than minor because, if left uncorrected, they would become a more significant safety concern in that future risk assessments could result in failures to properly manage increases in risk. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because mitigating systems were available and it did not affect the likelihood of external initiating events.

Inspection Report# : [2004003\(pdf\)](#)**G****Significance:** Jun 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PROVIDE ADEQUATE COMPENSATORY MEASURES FOR A LOSS OF FIRE WATER TO THE INTAKE STRUCTURE

The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.c and Unit 2 Technical Specification 6.8.1.f when the licensee provided inadequate manual suppression firefighting equipment upon a loss of automatic and manual suppression to the intake structures and service water pump areas. The equipment staged by the licensee would have required numerous actions by the fire brigade to ready a fire hose for manual fire suppression. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved human performance cross-cutting aspects associated with operations personnel not implementing appropriate compensatory measures.

The finding is greater than minor because it affected the mitigating systems cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Using Appendix F, "Determining Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because all remaining mitigating systems needed to respond to a loss of service water on either unit were available.

Inspection Report# : [2004003\(pdf\)](#)

G

Significance: Jun 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CORRECT INACCURATE HPSI AND LPSI VALVE POSITION INDICATIONS

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to correct inaccurate main control room valve position indicators on the Unit 2 high and low pressure safety injection system motor-operated valves. The valve position indicators were not calibrated for approximately 8 years yet were relied upon for indication in station procedures, including the loss of shutdown cooling procedure. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved problem identification and resolution cross-cutting aspects associated with operations personnel not identifying conditions adverse to quality.

The finding is greater than minor because it affected the mitigating systems cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the safety function of the valves was not affected and other indications were available to monitor system performance.

Inspection Report# : [2004003\(pdf\)](#)

G

Significance: Jun 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

UNTIMELY CORRECTIVE ACTIONS TO CLEAN DISCOLORED BORIC ACID DEPOSITS

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to take timely corrective action to correct indications of material wastage on Unit 2 Containment Spray Pump B. Specifically, the licensee did not implement actions to remove discolored boric acid deposits from the containment spray pump for approximately 9 months. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved problem identification and resolution cross-cutting aspects associated with the timely implementation of corrective actions for conditions adverse to quality.

The inspectors determined that this issue is more than minor because if left uncorrected it could become a more significant safety concern in that continued wastage of the pump could impact operability. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the actual wastage of the pump studs, nuts, and washers did not affect the safety function of the containment spray pump.

Inspection Report# : [2004003\(pdf\)](#)

Barrier Integrity**G**

Significance: Mar 24, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

INEFFECTIVE CORRECTIVE ACTIONS TO PREVENT RECURRENCE OF PWSCC OF ALLOY 600 MATERIAL

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to implement effective corrective actions to prevent recurrences of pressure boundary leakage due to primary water stress corrosion cracking of Alloy 600 reactor coolant system nozzles associated with pressurizer heater sleeves.

This finding was greater than minor because it affected the reactor safety barrier integrity cornerstone objective for providing reasonable

assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. Using NRC Manual Chapter 0609 Significance Determination Process Phase 1 Screening Worksheet, this performance deficiency affected the reactor coolant system barrier function. The finding was determined to be of very low safety significance because no actual leakage from the remaining pressurizer heater sleeves has occurred.

Inspection Report# : [2004002\(pdf\)](#)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Jun 23, 2004

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CONTROL A HIGH RADIATION AREA

The inspector identified an event in which the licensee failed to control a high radiation area in violation of Unit 2 Technical Specification 6.13.1 after workers received abnormal dosimeter readings on October 14, 2003. The licensee performed dose measurements and found an uncontrolled high radiation area in the Unit 2 sample cooler room. The licensee should have been alerted to the potential for a high radiation area in this room when reactor coolant system radioactivity levels increased and high radiation areas were identified in adjoining areas on October 12, 2003. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The issue involved human performance cross-cutting aspects associated with the thoroughness of radiation surveys by radiation protection personnel.

The failure to control a high radiation area is a performance deficiency. This finding is greater than minor because it was associated with one of the cornerstone attributes and affected the cornerstone objective, in that, inadequate exposure controls of a high radiation area affected the licensee's ability to ensure adequate protection of worker health and safety from exposure to radiation. Because the finding involved the potential for workers to receive significant, unplanned, unintended dose as a result of conditions contrary to Technical Specification requirements, the inspector used the occupational radiation safety significance determination process described in Manual Chapter 0609, "Significance Determination Process," Appendix C, "Occupational Radiation Safety Significance Determination Process," to analyze the significance of the finding. The inspector determined that the finding was of very low safety significance because it did not involve (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.

Inspection Report# : [2004003\(pdf\)](#)

Significance:  Mar 24, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

FAILURE TO PERFORM A RADIOLOGICAL SURVEY

Green. A self-revealing noncited violation of 10 CFR 20.1501(a) was identified for the failure to perform a radiological survey. On September 25, 2003, while performing a resin efficiency comparison test, a chemistry specialist received an electronic dosimeter dose rate alarm. A physical survey by radiation protection indicated 500 millirem/hour on contact and approximately 80 millirem/hour at 30 centimeters. Radiation protection performed an evaluation before the test. The calculated dose rates were expected to be 41 millirem/hour on contact and approximately 2 millirem/hour at 30 centimeters. The actual dose rate differed from the calculated dose rates because of a miscommunication of the actual sample activity between radiation protection and chemistry personnel.

The failure to perform a radiological survey associated with the use of a resin testing apparatus is a performance deficiency. This finding is greater than minor as it is associated with the Occupational Radiation Safety Program and Process attribute and affected the cornerstone objective to ensure adequate protection of the worker's health and safety from exposure to radiation. Since this occurrence involves workers unplanned, unintended dose or potential of such a dose which could have been significantly greater as a result of a single minor, reasonable alteration of circumstances, this finding was evaluated using the Occupational Radiation Safety Significance Determination Process. The finding was determined to be of very low safety significance because it was not associated with ALARA planning or work controls, there was no overexposure or a substantial Significance Determination Process potential for an overexposure, and the ability to assess dose was not compromised.

Inspection Report# : [2004002\(pdf\)](#)

Public Radiation Safety

G**Significance:** Jun 23, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

IMPROPERLY INSTALLED REACTOR COOLANT SAMPLE SINK MODIFICATION

A self revealing noncited violation of Unit 2 Technical Specification 6.8.1.a was reviewed for the failure to follow written procedures associated with the modification of the reactor coolant sample sink. Specifically, the licensee improperly connected the discharge of the reactor coolant sample sink into a secondary drain header which ultimately drained into the main condenser. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program.

This finding is more than minor because it was analogous to Example 3.a in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the modification required rework to correctly address design concerns. Using Appendix D, "Public Radiation Safety Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the licensee was able to assess the amount and curie content of the reactor coolant introduced into the secondary plant and there was no dose impact to the public.

Inspection Report# : [2004003\(pdf\)](#)**G****Significance:** Jun 18, 2004

Identified By: Self Disclosing

Item Type: NCV NonCited Violation

RADIOACTIVE SHIPMENT PACKAGE EXCEEDED 10 CFR 71.47 RADIATION LIMITS

The team reviewed a self-revealing, non-cited violation of 10 CFR 71.47 resulting from the licensee's failure to correctly prepare a radioactive shipment so that dose rates did not exceed regulatory limits. Specifically, on March 24, 2003, the licensee was notified by a shipment recipient that the contact radiation dose rate of a package exceeded 200 millirem per hour. A contact radiation dose rate of 380 millirem per hour was identified on the bottom of the package. However, the accessible radiation levels to the public from underneath the flatbed trailer were only 70 millirem per hour. The finding was placed into the licensee's corrective action program.

The finding was greater than minor because it is associated with the Public Radiation Safety Cornerstone attribute of Program and Process and affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials). The finding had very low safety significance because: (1) it involved radioactive material control, (2) it was a transportation issue, (3) external radiation levels were exceeded, (4) dose rates in excess of regulatory limits were not accessible to the public, and (5) the radiation levels did not exceed two times the federal limits. This finding also had crosscutting aspects associated with human performance

Inspection Report# : [2004009\(pdf\)](#)

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

Last modified : March 09, 2005