Arkansas Nuclear 1
1Q/2005 Plant Inspection Findings

Initiating Events

Significance: G Mar 24, 2005
Identified By: Self Disclosing
Item Type: FIN Finding
INADEQUATE MAINTENANCE PROCEDURE FOR THE MAIN FEEDWATER BLOCK VALVE MOTOR ACTUATOR
A self-revealing finding was identified for an inadequate maintenance procedure which did not include vendor recommended maintenance for electrical tightness checks for the Unit 1 main feedwater block valves. As a result of a loose connection, Valve CV-2675 failed to fully close after a reactor trip on August 29, 2003. The valve failure led to an inability to control steam generator level which resulted in an automatic initiation of the emergency feedwater system. This finding had cross cutting aspects of human performance in the area of resources, in that the maintenance procedure did not have technically accurate instructions for this type of actuator since the procedure did not include the connections in the clutch housing.

This finding is more than minor because it affected the initiating events cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions and affected the cornerstone attribute of procedural quality because an inadequate maintenance procedure increased the probability of a steam generator overfeed event. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the issue was determined to have very low safety significance because emergency feedwater initiation and control and rapid feedwater reduction systems both performed as designed and no steam generator overfeed event occurred.
Inspection Report# : 2005002*(pdf)*

Significance: G Dec 31, 2004
Identified By: Self Disclosing
Item Type: NCV NonCited Violation
OPERATOR ACTION DUE TO INADEQUATE PROCEDURE RESULTS IN MOMENTARY INCREASE IN REACTOR POWER ABOVE RATED THERMAL POWER
A self-revealing noncited violation of Unit 1 Technical Specification 5.4.1, "Procedures," was reviewed for an inadequate procedure related to the recovery from a control rod asymmetric fault. Station Procedure OP 1203.003, "Control Rod Drive Malfunction Action," contained no steps for resetting faults utilizing the fault reset switch and, in absence of appropriate guidance, operators took action which allowed outward automatic rod motion which resulted in an unplanned reactor power increase to 101.9 percent. This issue involved human performance crosscutting aspects associated with control room personnel taking non-urgent, non-proceduralized actions without involving management. This issue also involved problem identification and resolution crosscutting aspects associated with the operations staff failing to generate procedural guidance following two previous similar occurrences. Procedural improvements and other corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report (CR) ANO-1-2004-2428.

This finding is more than minor because it is analogous to Example 4.b in Appendix E, "Examples of Minor Issues," to Manual Chapter 0612, "Power Reactor Inspection Reports," because a significant procedural error caused an unplanned reactor power transient. Using the Phase 1 worksheets in Manual Chapter 0609, "Significant Determination Process," the finding was determined to have very low safety significance (Green) because this transient initiator does not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available.

Inspection Report# : 2004005*(pdf)*

Significance: G 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)*

Significance: G Jun 23, 2004
Identified By: Self Disclosing
Item Type: FIN Finding
FAILURE TO IMPLEMENT CORRECTIVE ACTIONS FOR TURBINE LUBE OIL SYSTEM
A self revealing finding was reviewed for the inadequate identification and resolution of problems with the main turbine trip oil system that contributed to a turbine trip and reactor trip on Unit 1. Because the licensee did not adequately address problems with operation of the main turbine lube oil system, an operator released the main turbine reset lever after mistakenly thinking a main turbine trip had been reset. 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 fully informing all members of the on-shift crew of plant conditions.

The finding is greater than minor because it was analogous to Example 4.d in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the failure to take adequate corrective action contributed to an operator error. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because, although it resulted in a reactor trip, no other complicating events were caused by the error and all mitigating systems remained available to the operators.
Inspection Report# : 2004003*(pdf)*

Mitigating Systems

Significance: G Feb 11, 2005
Identified By: NRC
Item Type: NCV NonCited Violation
9 examples of failure to follow boric acid control procedures
Green. The team identified a noncited violation of 10 CFR 50, Appendix B, Criterion V (Procedures) for nine examples of the failure to follow plant procedures with respect to documenting, evaluating and correcting boric acid leaks. This issue has crosscutting aspects associated with problem identification and resolution, as the licensee was not effective at ensuring compliance with the boric acid corrosion program following three similar noncited violations (since 2001).

The failure to follow boric acid control procedures was a performance deficiency. This issue is greater than minor because it affected the mitigating systems cornerstone objective of ensuring availability, reliability, and capability of mitigating systems. The issue is similar to non-minor example 4.a. of Manual Chapter 0609 Appendix E, in that the licensee routinely failed to follow these plant procedures. The finding had very low safety significance (Green) because the affected equipment remained operable consistent with Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," Revision 1.

Inspection Report# : 2005009*(pdf)*

Significance: G Feb 11, 2005
Identified By: NRC
Item Type: FIN Finding
Long-standing reactor coolant pump and molded case circuit breaker problems
Green. The team identified a finding, with two examples, where the licensee did not take prompt actions to address longstanding equipment problems that could impact the initiating events and mitigating system cornerstones. Specifically: 1) reactor coolant pump vibrations on two reactor coolant pumps exceeded vendor recommended alert levels, for approximately 15 years in one case; and 2) the licensee has not promptly addressed the extent of condition for molded case circuit breaker problems. This issue involved crosscutting aspects associated with problem prioritization.

The failure to address these longstanding equipment problems is a performance deficiency. Each issue was more than minor because it either affected the Initiating Events or Mitigating System cornerstone objectives of limiting the likelihood of initiating events (reactor coolant pump vibrations) or ensuring the availability of systems that mitigate plant accidents (molded case circuit breakers). Both issues were of very low safety significance because the affected equipment remained operable consistent with Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," Revision 1.
Inspection Report# : 2005009*(pdf)*

Significance: G Dec 31, 2004

Identified By: NRC
Item Type: NCV NonCited Violation
UNTIMELY CORRECTIVE ACTION TO FIX OIL LEAK RENDERS EDG INOPERABLE
A noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the failure to take timely corrective action to repair an oil leak on a temperature switch for the Unit 1 Emergency Diesel Generator K-4B in May 2004. This failure resulted in the oil leak progressively worsening and ultimately developing into a leak which challenged the emergency diesel generator safety function. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as CR ANO-1-2004-1705.

The finding was associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of equipment availability and reliability. Therefore, the finding is greater then minor. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the inspectors determined that the finding was of very low safety significance since the condition that would have rendered the EDG inoperable only existed for five days which was less than the allowed outage time in the Technical Specifications. In addition, this finding did not screen as risk significant due to external initiating events.
Inspection Report# : 2004005*(pdf)*

Significance: G 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)*

Significance: G Sep 23, 2004
Identified By: NRC
Item Type: NCV NonCited Violation
NONCONSERVATIVE CALCULATION OF DESIGN BASIS INTAKE STRUCTURE VENTILATION
The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure of the licensee to correctly translate the design basis heat removal requirements for the Unit 1 intake structure into specifications for the ventilation opening sizes. Measurements of the openings by the inspectors were smaller than those assumed in the licensee's heat removal calculations. Analyses using the smaller dimensions resulted in a 13 percent reduction in the heat removal capability. The licensee has taken action to update their calculation with the correct opening sizes. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-1-2004-1829.

This finding is more than minor because it was analogous to Example 3.i of Appendix E, "Examples of Minor Issues," to Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," in that the licensee's engineering staff had to reperform analyses due to a significant dimensional discrepancy. This finding affected the mitigating systems cornerstone. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the inspectors consider this finding to have very low safety significance because it did not result in an actual loss of safety function.

Inspection Report# : 2004004*(pdf)*

Significance: G 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)*

Significance: G 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)*

Significance: G Jun 23, 2004
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO FOLLOW TAGOUT PROCEDURE IN THE USE OF DO NOT OPERATE TAGS
The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow procedures for equipment control. The licensee failed to follow Procedure OP-102, "Protective Tagging," Revision 1, in several respects in their use of "Do Not Operate" tags on motor-operated valve handwheels prior to the Unit 1 refueling outage.

These failures are greater than minor in that they affected the mitigating systems cornerstone attribute of equipment availability. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the tagging process did not affect any automatic safety functions.
Inspection Report# : 2004003*(pdf)*

Barrier Integrity

Significance: G Sep 23, 2004
Identified By: Self Disclosing
Item Type: NCV NonCited Violation
CORE ALTERATIONS WITH LESS THAN TWO OPERABLE SOURCE RANGE NUCLEAR NEUTRON MONITORS
A self-revealing violation of Unit 1 Technical Specification 3.9.2, "Nuclear Instrumentation," occurred when one of the two required source range nuclear neutron monitors failed during core alterations. The licensee continued movement of spent fuel assemblies from the reactor vessel for approximately 11 hours following the failure of the instrument. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-1-2004-0989.

The finding is more than minor because it affects the barrier integrity cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Appendix G, "Shutdown Operations Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the instrument failure did not affect the licensee's ability to maintain reactor coolant system inventory, terminate a leak path, or recover decay heat removal.

Inspection Report# : 2004004*(pdf)*

Significance: G Jun 23, 2004
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO FOLLOW REACTOR VESSEL BOTTOM HEAD INSPECTION PROCEDURE
The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow written procedures associated with the inspection of the reactor vessel bottom nozzle penetrations during Refueling Outage 1R18. Specifically, the licensee failed to inspect 100 percent of the lower head penetrations during inspections required by Procedure 2311.09, "Unit 1 and Unit 2 Alloy 600 Inspection," Revision 5 as described in NRC Bulletin 2003-002. 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 inattention to detail by engineering personnel during inservice examinations.

This finding is greater than minor because it affected the reactor safety barrier integrity cornerstone objective for providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because no actual leakage from the reactor vessel penetrations occurred.
Inspection Report# : 2004003*(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Significance: G Jun 18, 2004
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO CALIBRATE SELECT UNIT 1 EFFLUENT PROCESS MONITORS IN ACCORDANCE WITH ODCM REQUIREMENTS
The team identified a non-cited violation of Unit 1 Technical Specification 5.5.4 because the licensee failed to calibrate selected effluent monitoring instrumentation in accordance with Offsite Dose Calculation Manual specifications. Specifically, the liquid radioactive waste monitor (RE-4642) and the waste gas holdup system monitor (RE-4830) were not calibrated across the full range of energies that the instruments would be expected to detect. Additionally, the licensee's calibration process for these monitors did not establish that the channel outputs responded with an acceptable range and accuracy to the primary or secondary calibration sources. The licensee used a radioactive source to qualitatively verify that the monitor identified the primary calibration source energy peak but did not require a quantitative response. The finding was placed into the licensee's corrective action program.

The finding is more than minor because it was associated with the Public Radiation Safety Cornerstone plant equipment/process radiation monitoring attribute and affected the associated cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain. The finding had very low safety significance because: (1) the finding did not involve radioactive material control, (2) it involved the effluent release program, (3) it impaired the licensee's ability to assess dose, (4) it did not result in the licensee's failure to assess dose because the licensee was able to assess dose by alternate means, and (5) doses did not exceed 10 CFR Part 50, Appendix I, values
Inspection Report# : 2004009*(pdf)*

Significance: G 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

Significance: N/A Feb 11, 2005
Identified By: NRC
Item Type: FIN Finding
PIR Inspection
The team reviewed approximately 260 condition reports, apparent and root cause analyses, as well as supporting documents, to assess problem identification and resolution activities. In general, performance in most areas had improved when compared to the prior problem identification and resolution assessment. Notwithstanding the improvements, poor problem evaluations and untimely resolution of some issues continued to result in self-disclosing and NRC identified violations and findings. The licensee has specified remedies to curb these performance problems. Overall, the procedures and processes were generally effective; thresholds for identifying issues were low and, in most cases, corrective actions were adequate to address conditions adverse to quality.

Based on the interviews conducted, the team concluded that a positive safety conscience work environment exists at Arkansas Nuclear One, Units 1 and 2. The team determined that employees felt free to raise safety concerns to their supervision, the employee concerns program, and the NRC. The team received a few isolated comments regarding trust of site management, an increased work load caused by the corrective action process, and the perception for negative consequences for going to the NRC with safety issues. However, the interviewees all believed that potential safety issues were being addressed and there were no instances identified where individuals had experienced consequences for bringing safety issues to the NRC . The team determined that licensee management was aware of the perceptions and was taking action to address them.

Inspection Report# : 2005009*(pdf)*

Last modified : June 17, 2005