Arkansas Nuclear 2
4Q/2011 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2011
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Provide Adequate Work Instruction Results in a Main Feedwater Recirculation Valve Failing Open
The inspectors documented a self-revealing finding for inadequate work instructions that resulted in the failure of a Unit 2 main feedwater pump A recirculation valve. Specifically, the licensee failed to provide adequate work instructions for reassembling and testing of the Unit 2 main feedwater recirculation valve, 2CV-0731. This valve failed full open during full power operations resulting in exceeding licensed reactor power. The licensee has implemented corrective action to communicate the importance of the positioning of the feedback arm support bracket and has changed the work orders to verify angle and tension of the feedback arm following reassembly of the positioner. The licensee entered this issue into the corrective action program as Condition Report ANO-CR-2-2011-1782.

The failure to provide adequate work instruction for the assembly and testing of the Unit 2 main feedwater pump A recirculation valve positioner was determined to be a performance deficiency, because it was within the licensee's ability to foresee and correct and was a failure to meet station requirements to provide adequate maintenance work instruction to maintenance personnel. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Initiating Events cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety function during power operations. Specifically, the failure of the recirculation valve caused reactor power to exceed licensed reactor power. Using MC 0609, Exhibit 1, "Phase 1 Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because it did not contribute to both the likelihood of a reactor trip and that mitigation equipment or functions would not be available. The inspectors determined that the finding did not have a crosscutting aspect because the performance deficiency is not indicative of current plant performance.
Inspection Report# : 2011004 *(pdf)*

Significance: G Sep 30, 2011
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Provide Adequate Work Instruction Results in Failed Bearing on Motor Generator Set
The inspectors documented a self-revealing finding for an inadequate work instruction for the 2-02 control element motor generator set flywheel bearing replacement that resulted in a failure of that bearing. Specifically, the licensee failed to provide instructions to obtain flywheel shaft dimensions to ensure adequate interference fit between the bearing and the shaft during corrective maintenance. This bearing subsequently failed on April 6, 2011. The licensee placed the issue into the corrective action program as Condition Report ANO-CR-2-2011-1817. The licensee replaced the failed bearing and shaft assembly and the system was returned to service.

The failure to provide adequate maintenance work instruction to verify dimensional fit up between the flywheel shaft and bearing for the Unit 2, 2-02 motor generator set prior to reassembly was determined to be a performance deficiency. Specifically, it was within the licensee's ability to foresee and correct and was a failure to meet station requirements to provide adequate maintenance work instruction to maintenance personnel. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Initiating Event Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, due to both control element motor generator sets being in the same room, the failure of the motor generator flywheel bearing caused the failure of that motor generator shaft and could have affected the only operating motor generator set and resulted in a reactor trip. Using Manual Chapter 0609, Exhibit 1, "Phase 1 Initial Screening and Characterization of Finding," the

finding was determined to be of very low safety significance because it did not contribute to both the likelihood of a reactor trip and that mitigation equipment or function would not be available. The inspectors determined that the finding did not have a crosscutting aspect because the performance deficiency is not indicative of current plant performance as the cause of not developing adequate work instructions stems from the late 1990s.
Inspection Report# : 2011004 *(pdf)*

Mitigating Systems

Significance: G Mar 31, 2011
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Take Timely Corrective Action to Correct a Condition Adverse to Quality Associated with 4160 Volt Vacuum Breakers
Green. The inspectors documented a self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion XVI for the failure to take timely corrective action to correct a condition adverse to quality. Specifically, the licensee identified an issues the Siemens vacuum breakers' plunger operated auxiliary switches (STA device) becoming stuck in mid travel and would prevent the auxiliary switches from working properly, but failed to correct this issue in a timely manner and resulted in the failure of offsite power transfer test from startup transformer 3 to startup transformer 2.

The failure of the licensee to take prompt corrective action for a previously identified condition adverse to quality was a performance deficiency. Specifically, the licensee was aware of STA devices hanging up during several breaker tests and identified a cause for this phenomenon, initiated corrective action, but failed to implement the corrective action prior to subsequent de-energization of the 2A2 bus during an offsite power transfer test. This was determined to be a performance deficiency because it was within the ability of the licensee to foresee and correct, and was a violation of NRC requirements. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Events cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Using Manual Chapter 0609, "Significance Determination Process," Appendix G, Checklist 3, for shutdown operations, and was determined to be of very low safety significance because the core heat removal guidelines associated with instrumentation, training and procedures, and equipment were met. Specifically, both trains of shutdown cooling remained operable with all necessary support equipment. This finding was determined to have a crosscutting aspect in the area of human performance, associated with work control, in that the licensee failed to appropriately plan work activities by incorporating the need for planned contingencies. Specifically, the licensee failed to incorporate contingency actions to correct any deficiencies discovered during inspection of the STA devices in the 2R20 refueling outage, [H.3(a)].

Inspection Report# : 2011002 *(pdf)*

Significance: G Feb 18, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Resolve Adverse Conditions in 120 Volt Vital Inverters in a Timely Manner
The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," because the licensee did not promptly identify and correct a condition adverse to quality that affected static uninterruptible power supply inverters used to power vital and safety related loads. Specifically, the licensee did not identify and correct an issue with undersized constant voltage transformers installed in safety-related 120-volt alternate current inverters. As a result, when a constant voltage transformer in one of the inverters became saturated from a voltage spike or electrical malfunction, it would impact an entire train of inverters. The licensee entered this issue into their corrective action program for resolution as CR-ANO-C-2011-0440. The immediate corrective actions following the additional failures included installation of direct current fuses. The planned corrective actions included installation of a modification to install blocking diodes in the 125 volt direct current input of each vital inverter to prevent faults or transients from adversely affecting the other inverters connected to the same bus.

This finding is greater than minor because it is associated with the design and equipment performance attributes of the Mitigating System cornerstone and affects the cornerstone objective to ensure the availability and reliability of safety-related inverters that respond to initiating events to prevent undesirable consequences in that these inverters supply power to vital and safety related loads. The inspectors evaluated the significance of this finding using Phase 1 of the IMe 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations" given the importance of the system and the fact that this condition affected an entire train of safety-related inverters due to a voltage spike or electrical malfunction. The inspectors determined that the finding was of very low safety significance (Green) because it is not a qualification deficiency, did not represent a loss of a safety function of a system or a single train greater than its Technical Specification completion time, and did not screen as potentially risk significant due to external events. The inspectors did not assign a crosscutting aspect because the finding is not reflective of current performance

Inspection Report# : 2011006 *(pdf)*

Significance: G Aug 27, 2010
Identified By: NRC
Item Type: FIN Finding
Fire Protection Compensatory Measures Did Not Cover All Fire Protection Features
The team identified a finding because the licensee did not include fire protection features in Procedure 1000.120, “ANO Fire Impairment Program,” Revision 20. The approved fire protection program required implementing compensatory measures for degraded fire protection systems and features, but the fire impairment implementing procedure addressed only action to identify, document and apply compensatory measures for specific fire protection systems. The team identified that the licensee did not implement compensatory measures for periods when the Appendix R emergency lighting units were placed out of service for maintenance and testing. This finding has been entered into the corrective action program as CR-ANO-C-2010-02205.

Failure to ensure that all of the applicable elements of the approved fire protection program were included in the fire impairment implementing procedure is a performance deficiency. The finding is more than minor because it is associated with the Protection Against External Events attribute of the Mitigating Systems cornerstone since it affected the availability, reliability, and capability of systems that respond to fire events to prevent undesirable consequences. Because this issue relates to fire protection, the team used the guidance of Manual Chapter 0609, Appendix F, Attachment 2, to determine that this fire prevention and administrative control deficiency had a low degradation rating in that it minimally impacted the fire protection program. Based on this, the finding screened as having very low safety significance (Green) during a Phase 1 significance determination. This finding is identified as FIN 05000313; 05000368/2010006¬-01, Inadequate Compensatory Measures for Out-Of-Service Appendix R Emergency Lights. No cross cutting aspect was associated with this finding because the team determined that this deficiency is not indicative of current performance because this practice existed for longer than three years.

Inspection Report# : 2010006 *(pdf)*

Barrier Integrity

Significance: G Sep 30, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Take Timely Corrective Actions for Invalid Local Leak Rate Test
The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Actions” for the licensee’s failure to take corrective action for an invalid local leak rate test performed on the Unit 2 escape hatch, 2C-2. Specifically, the licensee failed to take appropriate and timely corrective action to develop an appropriate testing method for the inner and outer escape hatch door seals. The issue was entered into the licensee’s corrective action program as Condition Report CR-ANO-2-2011-3198.

The inspectors determined that the licensee’s failure to develop an adequate testing method that did not use the strong

backs to precondition the escape hatch door seals prior to the 2R20 fall 2009 outage was a performance deficiency. Specifically, the licensee failed to provide timely corrective actions to a condition adverse to quality that had been identified in a previous NRC identified noncited violation and was within the licensee's ability to foresee and correct. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because the finding does not represent a degradation of the radiological barrier, or the smoke and toxic gas barrier functions provided for the control room, or does not represent an actual open pathway in the physical integrity of the reactor containment or a heat removal component. The finding was determined to have a crosscutting aspect in the area of problem identification and resolution, associated with the corrective action program in that the licensee did not thoroughly evaluate the problem in a manner to make certain that the resolution addressed the causes and the extent of condition to ensure a new test method, that did not use preconditioning, would be completed in a timely manner to resolve the problem [P.1(c)].
Inspection Report# : 2011004 *(pdf)*

Significance: G Jun 03, 2011
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Provide Adequate Procedural Guidance Results in Control Element Assembly Shaft Extension Damage
The inspectors documented a self-revealing noncited violation of Unit 2 Technical Specification 6.4.1.a for an inadequate procedure that resulted in damaging a control element assembly shaft extension. Specifically, station procedure OP-2505.007, "Unit 2 Upper Guide Structure Installation," Revision 18, failed to give adequate guidance on aligning the center control element assembly shaft extension with the in-core instrumentation thimble support plate lifting frame funnel. This misalignment resulted in damaging the shaft extension, and required additional inspection and analysis for possible damage to the control element assembly and reactor fuel. The licensee entered this issue into the corrective action program as Condition Report CR-ANO-2-2011-1284.

The inspectors determined that the failure to provide adequate procedural guidance for installing the thimble support plate into the Unit 2 reactor vessel was a performance deficiency because it was within the licensee's ability to foresee and correct and also violated technical specifications. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events, and therefore a finding. Specifically, inadequate procedural guidance resulted in damaging a control element assembly and could have resulted in fuel cladding damage. Using MC 0609, Appendix G, "Shutdown Operations Significance Determination Process," the finding was determined to be of very low safety significance, green, because the finding did not prevent or degrade core heat removal, inventory control, electrical power, containment control, or core reactivity capabilities. The finding was determined not to have a crosscutting aspect because the performance deficiency occurred in 2002 and is not indicative of current plant performance.

Inspection Report# : 2011003 *(pdf)*

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

Last modified : March 02, 2012