

# Arkansas Nuclear 1

## 3Q/2010 Plant Inspection Findings

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### Initiating Events

**Significance:**  Jun 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Follow Natural Emergencies Procedure to Control Site Missile Hazards During Severe Weather Warnings and Watches**

The inspectors identified a noncited violation of Technical Specification of 5.4.1.a for failure to follow Procedure OP-1203.025, "Natural Emergencies," Revision 30. Specifically, on April 23, 2010, the licensee entered the before mentioned procedure due to a tornado watch/warning and failed to identify and control potential missile hazards in and around the Unit 1 transformer yard. The licensee entered this issue into the corrective action program as Condition Report CR-ANO-C-2010-1003.

Failure of the licensee to assess and control potential missile hazards on site, in and around transformer yards was a performance deficiency. Specifically, the licensee failed to follow Procedure OP 1203.025, "Natural Emergencies," Revision 30 and adequately secure missile hazards on site. The performance deficiency was determined to be more than minor because it was associated with the external hazards attribute and directly affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability while in shutdown or at power conditions, and is therefore a finding. Specifically, the failure of the licensee to secure missile hazards on site, especially around the safety related transformers increased the likelihood of a loss of power event that could result in upsetting plant stability. The inspectors evaluated the significance of the finding using Manual Chapter 0609, "Significance Determination Process," Appendix G, Checklist 3, and determined the finding to be of a very low safety significance, Green, because the finding did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. The finding was determined to have a crosscutting aspect in the area of problem identification and resolution, associated with the corrective action program, P.1(d), in that the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity. Specifically, the licensee failed to take effective corrective action from a previous NRC-identified issue, in that the corrective actions did not ensure that the control room operators had adequate guidance to assess and control potential missile hazards on site prior to the onset of severe weather.

Inspection Report# : [2010003](#) (*pdf*)

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Failure to Recognize Critical Dimension Results in Reactor Coolant Pump Seal Failure**

The inspectors documented a self-revealing finding associated with the third stage seal failure of reactor coolant pump P-32C on April 18, 2010. Specifically, during reassembly of reactor coolant pump P-32C, the licensee failed to recognize and maintain the gap between the pumps slinger ring and splash shield as a critical dimension which was required for successful operation of the seal assembly. Following the seal replacement, this lack of recognition resulted in the failure of the pumps third stage seal, and a slight increase in reactor coolant system leak rate. This issue was entered into the licensee's corrective action program as condition report ANO-1-2010-1896.

The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the initiating events cornerstone, and affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations, and is therefore a finding. Specifically, the failure to recognize and maintain the gap between the reactor coolant pumps slinger ring and splash shield as a critical dimension resulted in the failure of the pumps third stage seal. Using NRC Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, Initiating Events Cornerstone, the finding was determined to have very low safety significance because assuming worst case

degradation, the finding would not result in exceeding the technical specification limit for any RCS leakage; nor could the finding have likely affected other mitigation systems resulting in a total loss of their safety function. The inspectors determined that since the licensee had not recently re-evaluated what dimensions were critical to the seals operation, and vendor documents were not specific to this dimension; this finding did not represent current plant performance and therefore did not have a cross-cutting aspect associated with it.

Inspection Report# : [2010003](#) (pdf)

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

**Troubleshooting in Switchyard Causes Loss of Power to Unit 1 and Unit 2 Startup Transformers**

The inspectors documented a self-revealing finding for failure to implement Procedure OP-1015.033, “ANO Switchyard Controls,” Revision 12. Specifically, On March 26, 2010, while performing 161 kV Breaker B1205 post-installation testing, several issues developed and testing activities morphed into troubleshooting activities. Per the above mentioned procedure, a new component and plant impact statement should have been performed. The impact statement should have described the new work activities, objectives and potential for plant impacts so that a proper assessment could be made by operations as to allow the work or not. These troubleshooting activities ultimately resulted in a lockout of the auto-transformer, which resulted in the lockout of startup Transformers 1 and 3 (offsite power source) for Units 1 and 2, respectively. The licensee entered the issue into the corrective action program as Condition Report CR-ANO-C-2010-0726.

The failure to properly implement Procedure OP-1015.033, ANO Switchyard Controls,” Revision 12, was a performance deficiency. Specifically, the licensee did not stop and obtain a component and plant impact statement when test activities transitioned into troubleshooting activities in the Arkansas Nuclear One switchyard. The troubleshooting activities led an auto lockout of the auto transformer and resulted in the loss of offsite power to startup transformers 1 and 3. The performance deficiency was determined to be more than minor because it is associated with the human performance attribute and directly affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown conditions, and is therefore a finding. The significance of the finding was determined using Manual Chapter 0609, “Significance Determination Process,” Appendix G, Checklist 4, and determined to be of very low safety significance, because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. The finding was determined to have a crosscutting aspect in the area of human performance associated with work practices, H.4(c), in that the licensee failed to ensure supervisory and management oversight of work activities in the switchyard such that nuclear safety is support. Specifically, the licensee became too involved helping solve the issue discovered in the switchyard and failed to recognize that Procedure OP-1015.033 need to be implemented.

Inspection Report# : [2010003](#) (pdf)

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Follow Nuclear Instrumentation Procedure Results in an Automatic Reactor Trip**

The inspectors documented a self-revealing noncited violation of Technical Specification 5.4.1.a, for failure to follow Procedure OP-1304.032, “Unit 1 Power Range Linear Amp Calibration at Power (NI Cal),” Revision 32, which resulted in a Unit 1 automatic reactor trip. Specifically, while at 20 percent reactor power, the licensee failed to place the reactor demand station, and the diamond rod control stations, of the B&W integrated control system, in manual during nuclear instrumentation calibrations, which resulted in automatic control rod withdrawal and reactor trip on high power. The licensee entered this issue into the corrective action program as Condition Report ANO-1-2010-2056.

The inspectors determined that the licensee failure to follow the nuclear instrumentation calibration procedure as written was a performance deficiency. Specifically, the licensee failed to properly implement Procedure OP-1304.032, “Unit 1 Power Range Linear Amp Calibration at Power (NI Cal),” Revision 32, and failed to place the integrated

control system into manual while calibrating nuclear instrumentation detectors. The performance deficiency was determined to be more than minor because it was associated with the human performance attribute and directly affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical plant safety function during power operations, and is therefore a finding. Specifically, the failure to follow the nuclear instrumentation calibration procedure resulted in an actual reactor trip. The inspectors evaluated the significance of the finding using Manual Chapter 0609, "significance Determination process," Appendix A, Exhibit 1, and determined that the finding was of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The finding was determined to have a crosscutting aspect in the area of human performance, associated with work practices, H.4(c), in that the licensee failed to ensure supervisory and management oversight of work activities such that nuclear safety is supported. Specifically, the control room supervisor and the shift manager failed to provide adequate supervision for the nuclear instrumentation calibration activity which resulted in a reactor trip.

Inspection Report# : [2010003](#) (pdf)

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

### **Failure to Consider Failure Modes Results in Main Feedwater Pump Over Speed Trip**

The inspectors documented a self-revealing finding for the failure of the licensee to perform a thorough design change evaluation which did not recognize and address all design failure modes. Specifically, the licensee failed to address the water intrusion into the electronic modules of the main feedwater pump control system from a possible failure of the condensate drain system of the control cabinet air conditioning units. On May 1, 2010, water emanating from the air conditioning units above the Lovejoy control cabinets, dripped into the electronic modules and caused oscillations in main feedwater Pump A speed before tripping on an actual over speed condition. Unit 1 automatically ran back from 100 percent power to 40 percent power as designed. The licensee entered this issue into the corrective action program as Condition Report CR-ANO-1-2010-2150.

The failure to adequately consider the potential failure modes of the air conditioning cooling to the local Lovejoy control cabinets for the main feedwater pumps was a performance deficiency. Specifically, the licensee did not consider the condensate drain pan and piping failure that could, and in this case did, introduce water into the control cabinet electronics and implement and actions to monitor or preventative measures to prevent this from occurring. The performance deficiency was determined to be more than minor because is associated with the design control attribute and directly affected the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations, and is therefore a finding. The inspectors evaluated the significance of the finding using Manual Chapter 0609, "Significance Determination Process," Appendix A, and determined the finding to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood mitigation equipment or functions would not be available. The inspectors determined that there was no crosscutting aspects associated with this finding because the performance deficiency is not indicative of current plant performance and is a latent issue.

Inspection Report# : [2010003](#) (pdf)

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## **Mitigating Systems**

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Correctly Translate Design Requirements Into Installed Plant Configuration**

The inspectors documented a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to assure that the applicable design basis for applicable structures, systems, and components were correctly translated into specifications, procedures, and instructions. Specifically, during initial plant construction the licensee failed to correctly translate the design requirements for the Unit 1 core

flood tanks manway covers into the installed plant equipment. This resulted in excessive nitrogen leakage from the covers which required the licensee to implement actions to mitigate the leakage until a permanent repair could be performed. This issue was entered into the licensee's corrective action program as condition report ANO-1-2010-1057.

The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the failure to correctly translate the manway design requirement into the installed plant configuration resulted in excessive nitrogen leakage which required the licensee to implement actions to mitigate the leakage until a permanent repair could be performed. Using NRC Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, Mitigating Systems Cornerstone, the finding was determined to have very low safety significance because it did not represent an actual loss of safety function and did not screen as potentially risk significant due to a seismic initiating event. The inspectors determined that since the licensee had not recently re-evaluated the design of the core flood tank manway covers; this finding did not represent current plant performance, and therefore did not have a crosscutting aspect associated with it.

Inspection Report# : [2010003](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Jun 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Adequately Implement Foreign Material Exclusion Controls**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with the licensee's failure to adequately implement Procedure EN-MA-118, "Foreign Material Exclusion," Revision 5. Specifically, between March 21, 2010, and April 22, 2010, multiple occasions were identified where licensee personnel failed to implement appropriate foreign material exclusion controls in areas designated as Zone 1 foreign material exclusion areas. This issue was entered into the licensee's corrective action program as Condition Reports ANO-2-2010-0262, ANO-2-2010-269, ANO-1-2010-0469, ANO-1-2010-0564, ANO-1-2010-0874, ANO-1-2010-0903, ANO-1-2010-0750, ANO-1-2010-1338, ANO-1-2010-1526, ANO-1-2010-1958, and ANO-C-2010-688.

The performance deficiency was more than minor because it affected the human performance attribute of the barrier integrity cornerstone and directly affected the cornerstone objective of providing reasonable assurance that physical barriers protect the public from radionuclide releases caused by accidents or events, and is therefore a finding. Specifically, station personnel's continued failure to implement appropriate foreign material exclusion controls would result in the introduction of foreign material into critical areas, such as the spent fuel pool or the reactor cavity, which in turn would result in degradation and adverse impacts on materials and systems associated with these areas. Using the Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," Phase 1 guidance, the finding is determined to have very low safety significance because the finding did not result in an increase in the likelihood of a loss of reactor coolant system inventory, degrade the ability to add reactor coolant system inventory, or degrade the ability to recover decay heat removal. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program, P.1(d), in that the licensee takes appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity.

Inspection Report# : [2010003](#) (*pdf*)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## 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.

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## Miscellaneous

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