

# Arkansas Nuclear 1

## 4Q/2007 Plant Inspection Findings

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### Initiating Events

**Significance:**  Sep 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO PERFORM A RISK ASSESSMENT WHEN REQUIRED BY 10 CFR 50.65(a)(4) FOR MOBILE CRANE USE IN THE VICINITY OF SAFETY-RELATED EQUIPMENT**

The inspectors identified a noncited violation (NCV) of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," involving the failure of the licensee to perform a risk assessment prior to mobile crane activities in the vicinity of Startup 2 transformer. This issue was entered into the licensee's corrective action program as Condition Report ANO-1-2007-1657.

The finding was more than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone, and it directly affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Additionally, if left uncorrected, the practice of not adequately evaluating crane activities in the vicinity of safety-related equipment by appropriately trained individuals would become a more significant safety concern in that it could result in a more than minimal increase in risk associated with other risk important equipment that would not be identified and not result in appropriate actions being taken. The inspectors evaluated this finding using the Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process" worksheets of Manual Chapter 0609 because the finding is a maintenance risk assessment issue. Flowchart 1, "Assessment of Risk Deficit," requires the inspectors to determine the risk deficit associated with this issue. This finding was determined to be of very low safety significance because the incremental core damage probability deficit was less than  $1 \times 10^{-6}$ . The finding had crosscutting aspects in the area of human performance associated with work control in that the licensee failed to appropriately plan and incorporate risk insights in work activities associated with mobile crane operations (H.3(a)).

Inspection Report# : [2007004](#) (*pdf*)

**Significance:**  Sep 23, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **INADEQUATE WORK PROCEDURES FOR EDG 2K-4A RESULTS IN A FIRE**

A self-revealing noncited violation of Technical Specification 6.4.1, "Procedures," was identified associated with the failure to ensure that adequate procedures were available for maintenance conducted on the Unit 2 Emergency Diesel Generator (EDG) 2K-4A. Specifically, the maintenance procedure used for the replacement of the four-barrel inspection plate did not have requirements for flatness checks. As a result, oil leakage from the inspection plate cover resulted in an exhaust manifold fire on the Unit 2 EDG on August 3, 2007. This issue was entered into the licensee's corrective action program as Condition Report ANO-2-2007-1073.

The finding was more than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone, and it directly affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance because the condition constituted a low degradation of a fire prevention and administrative controls feature. The finding had crosscutting aspects in the area of problem identification and resolution associated with operating experience in that the licensee failed to effectively implement changes to station processes and procedures in response to operating experience involving the importance of ensuring flatness of flanges in the diesel exhaust manifold (P.2(b)).

## Mitigating Systems

**Significance:**  Oct 19, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO MAINTAIN ADEQUATE FIRE BRIGADE STAFFING DURING ALTERNATE SHUTDOWN**

The team identified a noncited violation of License Conditions 2.C.(8) for Unit 1 and 2.C.(3)(b) for Unit 2 for failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to maintain adequate fire brigade staffing during fire scenarios requiring an alternative shutdown of Unit 2 coincident with a remote shutdown of Unit 1. The licensee entered the failure to maintain adequate fire brigade staffing under all circumstances into their corrective action process for resolution.

The failure to implement and maintain in effect all provisions of the approved fire protection program by failing to maintain adequate fire brigade staffing was a performance deficiency. The finding was more than minor since it was associated with the Mitigating Systems Cornerstone attribute of protection from external factors and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The significance of the finding was assessed using Appendix M of Manual Chapter 0609, "Significance Determination Process Using Qualitative Criteria." This finding was determined to be of very low safety significance (Green) by management review due to the short duration of the violation. The finding has a cross-cutting aspect in the area of human performance associated with resources because the licensee did not adequately ensure the procedures governing the procedure change process were complete and accurate (H.2.(c)).

Inspection Report# : [2007006](#) (pdf)

**Significance:**  Sep 23, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **LOSS OF FUNCTION OF EMERGENCY SWITCHGEAR CHILLER DUE TO INADEQUATE MAINTENANCE PROCEDURE**

A self-revealing noncited violation of Unit 1 Technical Specification 5.4.1.a was identified for the licensee's failure to provide adequate instructions for conducting maintenance on the north emergency switchgear chiller hot gas bypass valve. The failure to specify an appropriate fastener torque requirement in the work procedures resulted in a Freon leak that caused a loss of safety function of the equipment. This issue was entered into the licensee's corrective action program as Condition Report ANO-1-2007-1656.

The finding was greater than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone, and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance (Green) because it did not represent an actual loss of safety function of a non-Technical Specification train of equipment designated as risk significant per 10 CFR 50.65 for greater than 24 hours, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The cause of this finding was determined to have a crosscutting aspect in the area of problem identification and resolution associated with operating experience in that the licensee failed to incorporate vendor recommendations through changes to station maintenance procedures (P.2(b)).

Inspection Report# : [2007004](#) (pdf)

**Significance:**  Sep 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **INDICATING LAMP FAULT RESULTS IN LOSS OF CONTROL POWER TO STEAM DRIVEN EMERGENCY FEEDWATER PUMP**

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified involving the licensee's failure to take adequate corrective actions in response to a loss of control power to the Unit 1 turbine-driven emergency feedwater Pump P-7A that occurred on November 30, 2004. The lack of corrective actions resulted in a condition not being addressed which contributed to a subsequent failure that occurred on June 27, 2007. This issue was entered into the licensee's corrective action program as Condition Report ANO-1-2007-1672.

The finding was greater than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone, and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The cause of this finding was determined to have a crosscutting aspect in the area of problem identification and resolution associated with operating experience in that the licensee failed to implement relevant operating experience through changes to station equipment (P.2(b)).

Inspection Report# : [2007004](#) (*pdf*)

**Significance:**  Mar 08, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **INEFFECTIVE CORRECTIVE ACTIONS RESULTS IN A FIRE IN MOTOR CONTROL CENTER 2B-53**

The team reviewed a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for failure of the licensee to take effective corrective action for earlier events in 1991 and 2001. This failure to ensure positive engagement of 480 volt circuit breakers resulted, on October 30, 2006, in a fire in Motor Control Center 2B-53 and declaration of an alert. The licensee initiated Condition Report 2-2006-02444 to enter this issue into the corrective action program. In 1991, a fire occurred in Motor Control Center 2B-64 because misaligned breaker stabs created a high resistance connections that overheated when energized. For corrective action, the licensee trained electricians emphasizing the need to use care when installing breakers into breaker cubicles and proposed a revision to the maintenance procedure to inspect and ensure proper stab connections. In 2001, during inspections of Motor Control Center 2B-85, electricians discovered the center stab of one breaker in the breaker cubicle misaligned and found part of the spring clip burned away and part of the bus bar damaged. For corrective action, the licensee trained on proper insertion of a cubicle breaker into the motor control center and initiated a long-term action to perform a visual inspection of all Unit 2 motor control centers and their breakers.

The performance deficiency resulted from licensee personnel failing to take adequate corrective actions (e.g. revising procedures to include appropriate guidance). The finding is greater than minor because it is associated with the mitigating systems cornerstone attribute of protection against external factors and affects the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," were used to conclude that a Phase 2 analysis was required because the initiating events, mitigating systems, and barrier integrity cornerstones were affected. The team performed a Phase 2 analysis using Appendix A, "Determining the Significance of Reactor Findings For At-Power Situations," of Manual Chapter 0609 and the Phase 2 worksheets for Arkansas Nuclear One. From the Phase 2 analysis results, the team determined this finding had very low safety significance (Green). The team concluded the cause of the finding had no definitive cross-cutting aspects.

Inspection Report# : [2007007](#) (*pdf*)

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## **Barrier Integrity**

**Significance:**  Jun 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Identify the Preconditioning of Reactor Building Spray Pumps**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to promptly identify and correct a practice of unacceptable preconditioning prior to American Society of Mechanical Engineers Code inservice testing of the Unit 1 reactor building spray pumps. The licensee's corrective action program (via Condition Report ANO-C-1997-0288) failed to identify and correct the practice of venting the reactor building spray pump casing prior to conducting the quarterly surveillance test, which continued from 1997 through 2007. This issue was entered into the licensee's corrective action program as Condition Report ANO-1-2007-1645.

The finding was determined to be more than minor because it affected the procedure quality attribute of the barrier integrity cornerstone, and affected the associated cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radio nuclide releases caused by accidents or events. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because it did not involve an actual reduction in defense-in-depth for the atmospheric pressure control function of the reactor containment  
Inspection Report# : [2007003](#) (*pdf*)

**Significance:**  Mar 24, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **INADEQUATE MODIFICATION CONTRIBUTES TO FAILURE OF CONTROL ROOM ISOLATION DAMPER**

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified associated with the failure of the Unit 1 control room Damper CV-7907 to close on December 18, 2006. The licensee failed to control critical design parameters of the damper during a modification performed in 2004 to address a similar previous failure. This issue was entered into the licensee's corrective action program as Condition Report ANO-C-2006-2080.

This finding was greater than minor because it is associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because the condition only represented a degradation of the radiological barrier function provided for the control room. The finding had crosscutting aspects in the area of human performance associated with decision making because the licensee did not use conservative assumptions in decision making and had failed to verify the validity of the underlying assumptions that were used as justification. [H.1(b)]

Inspection Report# : [2007002](#) (*pdf*)

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

**Significance:**  Jun 23, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Conspicuously Post a Radiation Area**

The inspectors identified a noncited violation of 10 CFR 20.1902(a) because the licensee failed to conspicuously post a radiation area. On May 2, 2007, during a tour of the auxiliary building, the inspectors observed that the radiological

posting to the entryway of the Unit 1 Decay Heat Vault B was not conspicuously posted. An operations' "protected train" sign obscured the radiological posting. The licensee's immediate corrective action was to re-post the operations' sign to prevent obscuring the radiological posting.

The finding was greater than minor because it was associated with the occupational radiation safety cornerstone attribute of program and process and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radiation because it could have resulted in workers being exposed to higher radiation levels. When processed through the occupational radiation safety significance determination process, the finding was determined to be of very low safety significance because it was not as low as reasonably achievable finding, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not compromised. In addition, this finding had a crosscutting aspect associated with the human performance component of work practices (H.4(a)) because personnel failed to use human error prevention techniques such as self-checking or peer checking to verify that the radiation area was conspicuously posted.

Inspection Report# : [2007003](#) (*pdf*)

**Significance:**  Jun 23, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to use an Engineering Control as Required by a Radiation Work Permit**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a. because of a failure to use an engineering control as required by a radiation work permit. On April 25, 2007, four workers were unable to clear the personnel contamination monitors after working near the Unit 1 Steam Generator A. The licensee conducted an investigation and determined the steam generator high-efficiency particulate air ventilation (a radiation work permit required engineering control) had been rendered inoperable due to an incorrect line-up. The licensee's immediate corrective actions were to counsel the workers and brief associated personnel on the correct method for verifying high-efficiency particulate air ventilation.

The finding was greater than minor because it was associated with the occupational radiation safety cornerstone attribute of program and process and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radiation because it resulted in workers being exposed to higher radiation levels. When processed through the occupational radiation safety significance determination process, the finding was determined to be of very low safety significance because it was not as low as reasonable achievable finding, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not compromised. In addition, this finding had a crosscutting aspect associated with the human performance component of resources (H.2(c)) because the high-efficiency particulate air ventilation verification procedure was not adequate in that it did not have sufficient detail.

Inspection Report# : [2007003](#) (*pdf*)

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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**

**Significance:** N/A Apr 03, 2007

Identified By: NRC

Item Type: FIN Finding

### **Identification and Resolution of Problems**

The team reviewed 299 condition reports, several work orders, engineering evaluations, associated root and apparent cause evaluations, and other supporting documentation to assess problem identification and resolution activities. The team concluded that the licensee effectively identified, evaluated and prioritized corrective actions for conditions adverse to quality. The licensee improved in their ability to use the condition report process to track adverse conditions documenting abnormal configurations or potential challenges to the normal station processes. Also the licensee improved in their coordination among plant processes when closing condition reports to other corrective action or work control documents. However, the team concluded that the licensee, generally, implemented timely, effective corrective actions, although some examples, including one violation, indicate continuing weakness in this area.

With minor exceptions, the licensee appropriately evaluated industry operating experience for relevance to the facility and had entered applicable items in the corrective action program. The licensee appropriately used industry operating experience when performing root cause and apparent cause evaluations. The licensee performed effective quality assurance audits and self-assessments, as demonstrated by self-identification of poor corrective action program performance and identification of ineffective corrective actions. The team concluded that the licensee established an acceptable and improving safety conscious work environment. Management took action to address the write-in comments from the 2006 safety culture survey. The team concluded from interviews that, although no safety conscious work environment concerns existed, the complaints related to general culture factors, if not addressed, might result in safety conscious work environment concerns.

Inspection Report# : [2007007](#) (*pdf*)

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