UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4005

October 28, 2004

Jeffrey S. Forbes, Vice President,
Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, Arkansas 72801-0967

SUBJECT: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT 05000313/2004004 AND 05000368/2004004

Dear Mr. Forbes:

On September 23, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One, Units 1 and 2, facility. The enclosed integrated report documents the inspection findings, which were discussed on September 28, 2004, with you and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one unresolved item concerning the potential unavailability of an emergency diesel generator in Unit 1 due to a lube oil leak. This finding has potential safety significance greater than very low safety significance. This finding did represent an immediate safety concern until July 3, 2004, when your staff repaired a fitting associated with a temperature switch. Also, this report documents one apparent violation regarding the potential unavailability of a containment spray pump in Unit 2 due to a loose connection in the breaker circuitry. This finding has potential safety significance greater than very low safety significance. This finding did represent an immediate safety concern until August 9, 2004, when your staff repaired the connection in the breaker circuitry.

In addition, the report documents three NRC-identified and two self-revealing findings of very low safety significance (Green). Four of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these five findings as noncited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in Section 4OA7 of this report. If you contest these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control

Desk, Washington DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at Arkansas Nuclear One, Units 1 and 2, facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Troy W. Pruett, Chief
Project Branch D
Division of Reactor Projects

Dockets: 50-313
50-368
Licenses: DPR-51
NPF-6

Enclosure:
NRC Inspection Report 05000313/2004004 and 05000368/2004004
w/Attachment: Supplemental Information

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RIV:RI:DRP/D	RI:DRP/D	SRI:DRP/D	C:DRS/PEB	C:DRS/PSB
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10/6/04	10/6/04	10/6/04	10/25/04	10/25/04

C:DRS/EMB	C:DRS/OB	C:DRP/D		
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	50-313, 50-368
Licenses:	DPR-51, NPF-6
Report:	05000313/2004004 and 05000368/2004004
Licensee:	Entergy Operations, Inc.
Facility:	Arkansas Nuclear One, Units 1 and 2
Location:	Junction of Hwy. 64W and Hwy. 333 South Russellville, Arkansas
Dates:	June 24, 2004 to September 23, 2004
Inspectors:	E. Crowe, Resident Inspector R. Deese, Senior Resident Inspector J. Dixon, Resident Inspector J. Drake, Operations Engineer P. Gage, Senior Operations Engineer G. Replogle, Senior Reactor Inspector
Approved By:	Troy W. Pruett, Chief, Project Branch D Division of Reactor Projects

Enclosure

CONTENTS

SUMMARY OF FINDINGS

IR 05000313/2004004, 05000368/2004004; 6/24/04 - 9/23/04; Arkansas Nuclear One, Units 1 and 2; Adverse Weather Protection, Fire Protection, Maintenance Risk Assessments and Emergent Work Control, Operability Evaluations, Surveillance Testing, and Event Followup.

This report covered a 3-month period of inspection by resident inspectors, a maintenance rule inspector, and two operations inspectors. Four Green noncited violations, one Green finding, one apparent violation with potential safety significance greater than Green, and one unresolved item with potential safety significance greater than Green were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management's review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. 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 (Section 4OA3).

Cornerstone: Mitigating Systems

- TBD. An unresolved item 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-4A 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. The fitting was repaired and the leakage is no longer a safety concern. This finding involved problem identification and resolution crosscutting aspects associated with operations and

engineering personnel not recognizing the significance of the degraded condition and not implementing timely corrective actions to repair the leak. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-1-2004-1705.

This finding is unresolved pending a review of the duration of the condition and the completion of a significance determination. This finding affected the mitigating systems cornerstone. The finding was more than minor because it directly impacted the availability and reliability of an emergency diesel generator which is used to mitigate the loss of AC power to the respective safety-related bus. 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 was determined to potentially have greater than very low safety significance because the failure could have resulted in an actual loss of the safety function of the Train A emergency diesel generator during a loss of offsite power event (Section 1R15).

- TBD. The inspectors identified an apparent 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 it's group. This issue involved problem identification and resolution crosscutting aspects associated with maintenance technicians not identifying the cause of the breaker failure and not documenting nonconformances. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program as Condition Report ANO-2-2004-1712.

  This finding is being considered an apparent violation pending completion of its significance determination. 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 (Section 1R22).

- Green. 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 (Section 1R01).

- Green. 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 (Section 1R05).

- Green. 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 (Section 1R13).

Cornerstone: Barrier Integrity

- Green. 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 (Section 4OA3).

B. Licensee-Identified Violations

A violation of very low safety significance which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power and remained there throughout the inspection period.

Unit 2 began the inspection period at 100 percent rated thermal power and remained there until August 29, 2004, when operators reduced power to 10 percent rated thermal power and removed the main generator from service to correct a lowering flow condition in the main generator stator water cooling system. On August 31 the unit resumed 100 percent power operation and remained there for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Seasonal Susceptibilities

a. Inspection Scope

The inspectors completed a review of the licensee's readiness of seasonal susceptibilities involving extreme high temperatures. The inspectors (1) reviewed plant procedures, the Updated Final Safety Analysis Report, and Technical Specifications to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the below listed systems to ensure that adverse weather protection features were sufficient to support operability including the ability to perform safe shutdown functions; (3) evaluated operator staffing levels to ensure the licensee would maintain the readiness of essential systems required by plant procedures; and (4) reviewed the corrective action program to determine if the licensee identified and corrected problems related to adverse weather conditions.

- Week of July 19, 2004, Units 1 and 2, service water system

The inspectors completed one sample.

b. Findings

Introduction. The inspectors identified a Green noncited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the failure to correctly translate the Unit 1 intake structure ventilation design bases into specifications.

Description. Arkansas Nuclear One, Unit 1, Calculation 93-D-5015-01, “Unit 1 Intake Structure Natural Convection,” Revision 1, addressed the cooling of the components in the Unit 1 intake structure during a design basis accident. These components, which

include the service water pumps, rely on natural convection through doors and openings in the structure for cooling since the intake structure does not contain emergency powered ventilation fans. The inspectors measured the dimensions of the openings relied upon for natural convection and noted that the openings were not as large as those assumed in the calculation. The inspectors noted that engineering personnel had not considered the flow obstruction caused by the open louvers on the structure's access doors. Additionally, the inspectors noted that engineering personnel did not consider restrictions in air flow caused by support beams for the missile shields on the structure's roof along with the air flow restriction caused by the placement of two of the shields adjacent to vertical walls. The calculation assumed openings for the doors and roof openings for the intake structure would allow a free flow area for ventilation of 30 square feet. Dimensions measured by the inspectors yielded an area of 23 square feet. The inspectors concluded that the licensee's calculation for design basis cooling of the intake structure was nonconservative because the openings which would allow the convection air flow were not as large as assumed in the calculation. As part of their corrective actions, the licensee performed more precise measurements and updated their calculation showing that heat removal was 13 percent less than previously assumed with the openings that existed in the intake structure.

Analysis. The inspectors determined that this finding is more than minor because it is analogous to Example 3.i of Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the licensee's engineering staff had to reperform a calculation to assure accident analysis requirements were met after identification of a significant dimensional discrepancy. The finding affected the mitigating systems cornerstone. 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 result in an actual loss of safety function. The inspectors determined that even though the calculation was nonconservative, adequate convection flow would have been available to cool components in the Unit 1 intake structure.

Enforcement. Criterion III of 10 CFR Part 50, Appendix B, "Design Control," states, in part, that measures shall be established to assure that the design basis is correctly translated into specifications. Contrary to the above, engineering personnel did not correctly translate the design basis heat removal requirements for the Unit 1 intake structure into the proper specifications for the size of openings in the intake structure. Because of the very low safety significance of the finding and because the licensee has entered these issues into their corrective action program in Condition Report ANO-1-2004-1829, the inspectors treated this as a NCV, consistent with Section VI.A of the NRC Enforcement Policy, NCV 05000313/2004004-01, "Nonconservative Calculation of Design Basis Intake Structure Ventilation."

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial System Walkdowns. The inspectors (1) walked down portions of the three below listed risk important systems and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned; and (2) compared deficiencies identified during the walk down to the licensee's corrective action program to ensure problems were being identified and corrected.

- July 27, 2004, Unit 2 Inverters 2Y22 and 2Y24 and their associated portion of the AC and DC distribution systems, the inspectors performed a partial system walkdown of accessible portions of these distribution systems during periodic maintenance on Swing Inverter 2Y2224.

- August 24, 2004, Unit 1 emergency feedwater (EFW) system, the inspectors performed a partial system walkdown of accessible portions of the Train B portion of the system during periodic maintenance on the steam driven EFW pump (Train A).

- September 8, 2004, Unit 1 EFW system, the inspectors performed a partial system walkdown of accessible portions of the Train A portion of the system during periodic maintenance on the Train B portion of the EFW system.

The inspectors completed three samples.

Complete Walkdown. The inspectors (1) reviewed plant procedures, drawings, the Updated Final Safety Analysis Report, Technical Specifications, and vendor manuals to determine the correct alignment of the system; (2) reviewed outstanding design issues, operator work arounds, and corrective action program documents to determine if open issues affected the functionality of the system; and (3) verified that the licensee was identifying and resolving equipment alignment problems.

- August 11-12, 2004, Unit 1 decay heat system, the inspectors performed a complete system walkdown of accessible portions of the system. This walkdown was performed during the period when Decay Heat System Pump P-34A was taken out of service for scheduled maintenance.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

Annual Inspection. The inspectors observed a fire brigade drill on August 14, 2004, to evaluate the readiness of licensee personnel to prevent and fight fires, including the following aspects: (1) use of protective clothing, (2) use of breathing apparatuses, (3) placement and use of fire hoses, (4) entry into the fire area, (5) use of fire fighting equipment, (6) brigade leader command and control, (7) communications between the fire brigade and control room, (8) searches for fire victims and fire propagation, (9) smoke removal, (10) use of prefire plans, and (11) adherence to the drill scenario. The licensee simulated a fire in the Unit 2 controlled access dress out area (Fire Zone 2136 of the 386' elevation of the auxiliary building).

The inspectors completed one sample.

Quarterly Inspection. The inspectors walked down the six below listed plant areas to assess the material condition of active and passive fire protection features, their operational lineup, and their operational effectiveness. The inspectors (1) verified that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features; and (7) reviewed the corrective action program to determine if the licensee identified and corrected fire protection problems.

- June 24, 2004, Unit 1 computer room, Fire Zone 160-B
- August 12, 2004, Unit 1 East decay heat removal pump room, Fire Zone 10-EE
- August 13, 2004, Unit 1 West decay heat removal pump room, Fire Zone 14-EE
- September 9, 2004, Unit 1 control room, Fire Zone 129-F
- September 20, 2004, Unit 2 North electrical equipment room, Fire Zone 2091-BB
- September 20, 2004, Unit 2 lower North electrical penetration room, Fire Zone 2112-BB

The inspectors completed six samples.

b. Findings

Introduction. The inspectors identified a Green NCV of the Unit 2 operating license for the failure to perform hydrostatic testing of the carbon dioxide fire extinguishers.

Description. On June 24, 2004, the inspectors requested documentation of the latest hydrostatic test for a carbon dioxide fire extinguisher in Fire Zone 160-B. In response to this request, the licensee initiated CR ANO-1-2004-1544 which received an apparent cause evaluation. From this evaluation, the inspectors noted that the licensee had initiated corrective actions to determine the number of fire extinguishers with expired hydrostatic retest dates in 2001, following the receipt of NRC Information Notice 2001-004, "Neglected Fire Extinguisher Maintenance Causes Fatality." The licensee's inspection effort was stopped due to the large number of fire extinguishers with expired hydrostatic retesting dates (approximately 80 to 90 percent). The licensee decided that a wholesale repair/replacement plan was needed; however, the plan was never developed and implemented. While reviewing the corrective actions associated with CR ANO-1-2004-1544, the inspectors determined that no fire extinguishers had received the required hydrostatic test during the past 3 years because the licensee had suspended the maintenance work orders.

The licensee's fire hazard analysis described manual fire protection features as hose stations and carbon dioxide fire extinguishers in 97 of the 149 fire zones listed in the analysis. Currently, there are 228 carbon dioxide fire extinguishers strategically located in Units 1 and 2 that are afforded to fire watches and fire brigade members for the manual suppression of fires in the above 97 fire zones.

Analysis. The inspectors determined the issue was more than minor because, if left uncorrected, it would become a more significant safety concern in that internal degradation of the fire extinguishers would continue without any means of detection until the extinguisher was unable to perform its intended function as defined in the fire hazard analysis. 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 assumed that the issue affected the mitigating systems cornerstone and had very low safety significance (Green) because this fire protection element's performance and reliability was minimally impacted. This issue involved problem identification and resolution crosscutting aspects associated with fire protection technicians failing to correct adverse conditions in a timely manner.

Enforcement. Arkansas Nuclear One, Unit 2 facility operating license Condition 2.C.(3)(b) states, in part, that Entergy Operations, Inc. shall implement and maintain in effect all provisions of the approved fire protection program as described in Amendment 9A to the Safety Analysis Report and as approved in the safety evaluation dated March 31, 1992. Arkansas Nuclear One, Unit 2 Safety Analysis Report, Appendix 9A, "Fire Protection Program," states, in part, the ANO fire protection systems

consist of numerous components including portable extinguishers. Safety Analysis Report, Section 9.5.1, "Fire Protection Systems (FPS) - Codes and Standards," states, in part, that the fire protection system is designed in substantial compliance with the requirements of the National Fire Codes of the National Fire Protection Association (NFPA 1977). NFPA 10, "Standard for Portable Fire Extinguishers," Chapter 7, "Hydrostatic Testing," states, in part, that fire extinguishers shall be hydrostatically retested at intervals not exceeding those specified in Table 7.2, which establishes the test interval for carbon dioxide fire extinguishers as 5 years.

Contrary to the above, the licensee failed to perform hydrostatic retesting of carbon dioxide fire extinguishers every 5 years. Because of the very low safety significance and because the licensee included this condition in the corrective action program as CR ANO-1-2004-1544, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, NCV 05000368/2004004-02: "Failure to Perform Required Hydrostatic Testing of Pressurized Fire Extinguishers."

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

Semi-annual Internal Flooding. The inspectors (1) reviewed the Updated Final Safety Analysis Report, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving internal flooding; (2) reviewed the corrective action program to determine if the licensee identified and corrected flooding problems; (3) verified that operator actions for coping with flooding can reasonably achieve the desired outcomes; and (4) walked down the below listed areas to verify the adequacy of (a) equipment seals located below the floodline; (b) floor and wall penetration seals; (c) watertight door seals; (d) common drain lines and sumps; (e) sump pumps, level alarms, and control circuits; and (f) temporary or removable flood barriers.

- August 12, 2004, Unit 1, decay heat removal vault

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Quarterly Review.

a. Inspection Scope

The inspectors observed testing and training of senior reactor operators and reactor operators on September 14, 2004, in the Unit 2 simulator to (1) identify deficiencies and discrepancies in the training; (2) assess operator performance; and (3) assess the evaluator's critique. The training scenario involved plant conditions where an inadvertent containment isolation actuation signal, from a single train, resulted in a loss of all feedwater to the steam generators. The loss of all feedwater was followed with a faulted steam generator, requiring the crew to address increased containment temperature and pressure during natural circulation cooldown of the reactor coolant system.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Biennial Inspection.

a. Inspection Scope

The inspectors (1) evaluated examination security measures and procedures for compliance with 10 CFR 55.49; (2) evaluated the licensee's sample plan of the written examinations for compliance with 10 CFR 55.59 and NUREG-1021, as referenced in the facility requalification program procedures; and (3) evaluated maintenance of license conditions for compliance with 10 CFR 55.53 by review of facility records (medical and administrative), procedures, and tracking systems for licensed operator training, qualification, and watchstanding. In addition, the inspectors reviewed remedial training for examination failures for compliance with facility procedures and responsiveness to address failed areas.

Furthermore, the inspectors (1) interviewed 10 personnel, including operators, instructors/evaluators, and training supervisors, regarding the policies and practices for administering requalification examinations; (2) observed the administration of two dynamic simulator scenarios to one requalification crew; and (3) observed four evaluators administer six performance measures, including four in the control room simulator in a dynamic mode and two in the plant under simulated conditions.

The inspectors also reviewed the remediation process and the results of the biennial written examination. The results of the examinations were assessed to determine the licensee's appraisal of operator performance and the feedback of performance analysis to the requalification training program. The inspectors interviewed members of the training department and operating crews to assess the responsiveness of the licensed

operator requalification program. The inspectors also observed the examination security maintenance for the operating tests during the examination week.

Additionally, the inspectors assessed the Arkansas Nuclear One, Unit 2, plant-referenced simulator for compliance with 10 CFR 55.46 using Baseline Inspection Procedure 71111.11 (Section 03.11). This assessment included the adequacy of the licensee's simulation facility for use in operator licensing examinations and for satisfying experience requirements as prescribed by 10 CFR 55.46. The inspectors reviewed a sample of simulator performance test records (transient tests, surveillance tests, malfunction tests, and scenario-based tests), simulator discrepancy report records, and processes for ensuring simulator fidelity commensurate with 10 CFR 55.46. The inspectors also interviewed members of the licensee's simulator configuration control group as part of this review.

In addition to the biennial review for Unit 2, the inspectors reviewed the test results of the Unit 1 annual operating examination for 2004. Since this was the first half of the biennial requalification testing cycle, the licensee had not yet administered the written examination. These results were assessed to determine if they were consistent with NUREG 1021 guidance and Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process," requirements. This review included examination test results for 10 crews which included 56 licensed individuals.

b. Findings

No findings of significance were identified.

.3 Examination Security

a. Inspection Scope

The inspectors identified a minor violation of 10 CFR 55.49 for the licensee's failure to provide examination security. The examiners reviewed examination security during the onsite examination administration week for compliance with NUREG-1021 requirements. Plans for simulator security and licensed operator control were reviewed.

b. Findings

One examination security issue was identified by the licensee during the administration of the simulator static section of the written examination. A licensee representative, on the NRC examination security agreement, was inadvertently administered the same static examination as the one the individual had previously validated. This action was prohibited by NUREG-1021 and the security agreement. The error was immediately identified by the individual and reported to the cognizant instructor.

Subsequent to the identification of the administrative error, a static examination that the affected individual had not been exposed to was selected and approved for administration to the individual. The licensee performed a review of track records for all Unit 2 licensed operators and verified no other individual was administered, or was scheduled to be administered, any part of the biennial examination in which the individuals had previously participated in the validation process. Immediate licensee followup and short-term corrective actions were discussed with the inspector and NRC regional management and conservatively confirmed that no potential for communicating examination content existed, which would have the possible impact of compromising the licensed operator requalification examination.

As stated, in part, in 10 CFR 55.49, the integrity of an examination is considered compromised if any activity, regardless of intent, would have affected equitable and consistent administration of the examination. Although this finding constitutes a violation of minor significance that is not subject to enforcement in accordance with Section IV of the NRC's Enforcement Policy, it is being documented as required by NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8, Section ES 501, paragraph E.3.a. The licensee documented the problem in CR ANO-2-2004-1370.

1R12 Maintenance Effectiveness (71111.12)

.1 Quarterly Reviews

a. Inspection Scope

The inspectors reviewed the two below listed maintenance activities to (1) verify the appropriate handling of structure, system, and component (SSC) performance or condition problems; (2) verify the appropriate handling of degraded SSCs functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSCs issues reviewed under the requirements of the Maintenance Rule, 10 CFR Part 50, Appendix B, and Technical Specifications.

- Unit 2 engineered safety feature (ESF) inverter condition of momentary out-of-synchronization of the power supplies.

- Unit 1 auxiliary building heating, ventilation, and air conditioning system decay heat vault cooler failures

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.2 Biennial Maintenance Rule Implementation

a. Inspection Scope

Periodic Evaluation Reviews

The inspectors reviewed the licensee's last two Maintenance Rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants") periodic assessments. In addition, the inspectors reviewed the licensee's overall implementation of the Maintenance Rule. As part of the inspection, the inspectors reviewed the licensee's maintenance rule scope, (a)(1) determinations, performance criteria, program definitions, use of industry operating experience, and maintenance rule related self assessments. The inspectors verified the establishment of appropriate goals, corrective actions, and the impact of risk monitoring. The inspectors reviewed the conclusion reached by the licensee with regard to the balance of reliability and unavailability for specific maintenance rule functions. The minimum sample for the biennial inspection will consist of four SSCs/functions (of high risk significance to the extent available) that have suffered degraded performance or condition. The inspectors selected the following four problematic systems for a detailed review:

- Repeated cracking of Alloy 600 nozzles
- Repeated cracking of Unit 1, Control Rod Drive Mechanism Nozzle 56
- Repetitive problems with emergency diesel generator starting air receivers
- Failure of Reactor Coolant Pump P-32C

Identification and Resolution of Problems

The inspectors reviewed selected corrective action documents associated with maintenance rule related findings. The inspectors verified that the licensee took, or planned, appropriate corrective measures for identified issues.

The inspectors completed 4 samples.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

Risk Assessment and Management of Risk. The inspectors reviewed the below listed assessment activities to verify (1) the performance of risk assessments when required by 10 CFR 50.65 (a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and

completeness of the information considered in the risk assessment; (3) the licensee recognizes, and/or enters as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures; and (4) the licensee identified and corrected problems related to maintenance risk assessments.

- April 12, 2004, Unit 1, removal of fire/high energy line break Door 48 for the Service Water Pump P-4B cable replacement
- July 5, 2004, Unit 2, planned maintenance during the week
- July 12, 2004, Unit 2, planned maintenance during the week
- August 9, 2004, Unit 1, planned maintenance during the week
- August through September 2004, site modifications affecting the local start of the alternate AC diesel generator

The inspectors completed five samples.

Emergent Work Control. The inspectors (1) verified that the licensee performed actions to minimize the probability of initiating events and maintained the functional capability of mitigating systems and barrier integrity systems; (2) verified that emergent work-related activities such as troubleshooting, work planning/scheduling, establishing plant conditions, aligning equipment, tagging, temporary modifications, and equipment restoration did not place the plant in an unacceptable configuration; and (3) reviewed the corrective action program to determine if the licensee identified and corrected risk assessment and emergent work control problems for the below listed activity:

- July 21, 2004, Unit 2, emergent maintenance to replace a degraded cell on ESF Battery 2D11

The inspectors completed one sample.

b. Findings

Introduction. The inspectors identified two examples of a Green NCV of 10 CFR 50.65(a)(4) for the failure to perform adequate risk assessments.

Description. The licensee failed to consider the external risk from changing weather conditions in previous risk assessments. During the week of July 5, 2004, the licensee performed maintenance on the Unit 2 Emergency Diesel Generator (EDG) 2K-4A. On July 7, 2004, the licensee tagged out the EDG and subsequently the National Weather Service issued a thunderstorm warning. The inspectors questioned licensee personnel on how their risk assessments took into account weather as an external event contributor to risk during maintenance activities. In addition, the inspectors reviewed

Common Operations Directive COPD024, “Risk Assessment Guidelines,” Change 12, which the licensee uses to implement 10 CFR 50.65 (a)(4), Operating Procedure 1107.001, “Electrical System Operations,” Revision 60, and Operating Procedure 2107.001, “Electrical System Operations,” Revision 48. The inspectors determined that, except for the specific instances of a missile or external flood barrier being removed, the licensee had not considered the increase in risk from changing weather conditions during maintenance activities. The inspectors noted that Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance in Nuclear Power Plants," endorsed NUMARC 93-01, "Nuclear Energy Institute Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Section 11 of NUMARC 93-01 specified that emergent conditions (weather) could change the conditions of previously performed assessments and that the evaluation should be reperformed to address the changed conditions.

The inspectors determined that the licensee's corrective actions in response to NCV 05000313/2004003-03, “Failure to adequately assess risk due to external conditions,” were incomplete. While the inspectors noted that the licensee had updated COPD024, “Risk Assessment Guidelines,” and both units’ natural emergencies procedures (Operating Procedures 1203.025 and 2203.008), the inspectors found that the revised procedures were still deficient because, even with the changes, the potential still existed for risk to not be re-evaluated based on changing weather conditions.

The inspectors determined that the licensee failed to consider the additional risk to the plant from having a high energy line break (HELB) door removed. During the week of April 12, 2004, the licensee removed Door 48 to facilitate the installation of new power cables for the Unit 1 Service Water Pump P-4B. HELB Door 48 provided a barrier between the turbine building and the Unit 1 South switchgear room. The inspectors reviewed Common Operations Directive COPD024, “Risk Assessment Guidelines,” Change 12, and found that the document stated that HELB door requirements are not modeled quantitatively or qualitatively. Upon questioning the licensee, the inspectors determined that the licensee addressed HELB doors being removed through an engineering request, which included impact statements and contingency actions. As the licensee documented in CR ANO-C-2004-1402, the engineering request may not in all cases address an increase in risk from a 10 CFR 50.65(a)(4) perspective. While the licensee did station a continuous fire watch (Door 48 is also a fire barrier door), the engineering request did not address the increase in overall plant risk due to the lack of separation between the turbine building and a safety-related switchgear room.

Analysis. The inspectors determined that both examples affected the mitigating systems cornerstone and that the finding was more than minor because, if left uncorrected, it would become a more significant safety concern in that actions to manage increases in risk may not be implemented. Using the Phase 1 worksheets 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.”

The example involving the high energy line break door was analyzed using the Phase 1 worksheets in Manual Chapter 0609, “Significance Determination Process,” from which the inspectors determined that the finding affected the mitigating systems and barrier integrity cornerstones. As a result, the inspectors performed a Phase 2 analysis 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.” In this determination, the inspectors postulated a break which would disable the Train A 4160 VAC switchgear and that operations personnel would not be able to recover the switchgear. The inspectors assumed that the only affected event was a main steam line break and that the exposure time for the condition was 5 days. The Phase 2 analyses demonstrated that the finding was of very low safety significance. Using Appendix H, “Containment Integrity Significance Determination Process,” of Manual Chapter 0609, the inspectors determined that the finding was of very low safety significance because of the low core damage probability determined from the Phase 2 analysis.

Enforcement. 10 CFR 50.65(a)(4) requires, in part, that the licensee shall assess and manage the increase in risk that may result from proposed maintenance activities. Contrary to this, the licensee did not adequately assess risk from maintenance activities during adverse weather conditions and following the removal of a HELB barrier. Because of the very low safety significance and because the licensee included this condition in the corrective action program as ANO-C-2004-1279 and ANO-C-2004-1402, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/2004004-03; 05000368/2004004-03, “Failure to Adequately Assess Risk.”

1R14 Operator Performance During Nonroutine Plant Evolutions and Events (71111.14, 71153)

a. Inspection Scope

The inspectors (1) reviewed operator logs, plant computer data, and/or strip charts for the below listed evolutions to evaluate operator performance in coping with nonroutine events and transients; (2) verified that operator response was in accordance with the response required by plant procedures and training; and (3) verified that the licensee has identified and implemented appropriate corrective actions associated with personnel performance problems that occurred during the nonroutine evolutions sampled.

- July 21, 2004, Unit 2, the licensee replaced a degraded cell in ESF Battery 2D11

- August 29, 2004, Unit 2, the licensee reduced reactor power to 10 percent rated thermal power and removed the turbine generator from operation to allow replacement of the degraded stator water cooling filter which was causing reduced cooling flow to the main turbine generator

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors (1) reviewed plants status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability evaluation was warranted for degraded components; (2) referred to the Updated Final Safety Analysis Report and design basis documents to review the technical adequacy of licensee operability evaluations; (3) evaluated compensatory measures associated with operability evaluations; (4) determined degraded component impact on any Technical Specifications; (5) used the significance determination process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that the licensee has identified and implemented appropriate corrective actions associated with degraded components.

- CR ANO-1-2004-0989 Unit 1 source range Nuclear Instrument NI-502 failure during core alterations of the reactor vessel
- CR ANO-1-2004-1705 Unit 1 EDG K-4B lube oil leak at temperature switch TSH-5271
- CR ANO-1-2004-2076 Unit 1 service water pumps corrosion at wet end to pump column flange coupling
- CR ANO-2-2004-0779 Alternate AC diesel generator DC Battery 2D-55 service capacity concerns
- CR ANO-2-2004-1235 Unit 2 Excore C DC power supply voltage on plant protection system cabinet indicating low

- CR ANO-2-2004-1277 Unit 2 ESF Battery 2D11 low cell voltage on Cell 25

The inspectors completed six samples.

b. Findings

Introduction. An unresolved item was identified for the repeated failures of licensee personnel to promptly identify and correct degraded conditions associated with Unit 1 EDG K-4B Temperature Switch TSH-5271.

Description. In 1990, the temperature switch for the lubricating oil scavenging pump discharge (TSH-5271) was discovered leaking by the licensee. A leak repair was attempted by tightening the fitting which resulted in the threaded fitting breaking. Licensee personnel attempted to replace the switch fitting, but because no exact replacement fittings were readily available, they implemented a different fitting arrangement. The replacement fitting arrangement consisted of two 1/2 to 3/8-inch fittings coupled together to replace one 1/2 to 1/2-inch fitting. This new arrangement was smaller in diameter at the 3/8-inch threaded coupling and consequently not as robust. The replacement occurred without engineering personnel questioning the adequacy of the strength of the smaller fitting. The cantilever configuration of the fitting and switch in a high vibration environment was also not questioned by engineering personnel. The inspectors questioned the licensee concerning the EDG manufacturer's involvement related to the replacement configuration. No evidence was found that the EDG manufacturer was contacted.

The new fittings prevented oil leakage until 1995 when a leak was discovered and corrected. No additional problems were noted until June 2003 when a 3 drop per minute (dpm) leak was noticed by operations personnel during an EDG surveillance test. In September 2003 maintenance personnel disassembled and tightened the fitting using sealant to stop the leak. No leakage was observed during the next four surveillance runs.

During the January 12, 2004, surveillance run, the fitting developed a 10 dpm leak, which prompted licensee personnel to initiate another work order for repair of the leak. This work order was scheduled to be completed during the EDG outage in February 2005. The leak rate remained at 10 dpm during the next four surveillance runs.

On May 18, 2004, 1 week following the May surveillance run, the fitting began leaking at 4 dpm with the engine secured. CR ANO-1-2004-1442 was generated to document the condition and was closed without adjusting the priority to the last existing work order, which was still scheduled to be performed in February 2005.

During the May 31, 2004 surveillance run, operations personnel quantified the new leak rate at 136 dpm with the engine running. CR ANO-1-2004-1520 was generated to document the increased leak rate. This CR did not adequately address the significance of the increased leak rate on the operability of the EDG and the possibility of the leak becoming worse. Corrective actions assigned by this CR rescheduled leak repairs to August 2004.

During the June 28, 2004, surveillance run, the leak rate increased to 400 dpm with the engine running. A system engineer present during the surveillance run of the EDG was asked by operations personnel to evaluate the leakage by writing an additional CR. No CR was written and the repair activity was not rescheduled.

On July 2, 2004, operations personnel noted an increase in the leak rate from 6 to 14 dpm with the engine secured and generated CR ANO-1-2004-1700. In response to this CR, the licensee began planning for immediate repairs. During a walkdown on July 3, 2004, operations personnel discovered the fitting leaking at 600 dpm with the engine secured. Operations personnel declared the EDG inoperable and began repairs. Maintenance personnel discovered a 300 degree circumferential crack in the 3/8-inch section of one of the two fittings upon disassembly of the temperature switch. The licensee sent the fitting to an independent lab for failure analysis. The independent lab determined the failure of the fitting to be caused by high torque and vibration fatigue.

The inspectors reviewed the licensee's actions in response to the increasing leak rates and determined that after the observation of leakage on May 18, 2004, the licensee did not promptly identify a degrading leak. As a result, timely action was not taken to repair the leak.

Analysis. This finding has the potential to be more than minor because it affected the mitigating systems cornerstone objective of ensuring the availability and 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 inspectors determined that the finding may represent a loss of one train of a Technical Specification component for greater than the allowed outage time. As a result, the inspectors performed a Phase 2 analysis 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 inspectors assumed that (1) the leak rate would have increased on EDG K-4B as the amount of run time accumulated on the engine between September 23, 2003 and July 3, 2004, (2) the EDG would not have performed its safety function without exigent corrective actions to repair the fitting or replenish the lube oil, (3) the duration for not meeting the 6 hour offsite power recovery time, given the leak rate, was approximately 32 days, (4) licensee personnel would not have acted to replenish lube oil inventory until it manifested itself in a large leak at the temperature switch, and (5) licensee actions to replenish lube oil inventory were not credited because of the difficulty in retrieving the oil, transporting the

oil, and filling the sump. Using these assumptions, the inspectors determined that the finding had potentially greater than Green safety significance. The dominate core damage sequence involved a loss of offsite power with a failure of the EDGs and the failure to recover offsite power.

The duration of the condition and the application of the assumptions is under review by the regional senior risk analysts. Therefore, this finding is considered an unresolved item. This issue is not an immediate safety concern because on July 3, 2004, the licensee removed the EDG from service and repaired the degraded fitting with the original design, thereby restoring structural integrity to the EDG K-4B lube oil system. This finding involved problem identification and resolution crosscutting aspects associated with operations and engineering personnel not recognizing the significance of the degraded condition and not implementing timely corrective actions to repair the leak.

Enforcement. From May 18 to July 2, 2004, the licensee did not promptly identify and or implement actions to repair a degrading fitting on Temperature Switch TSH-5271. The licensee entered this condition in their corrective action program as CR ANO-1-2004-1705. Pending the determination of the duration of the condition and a review of the safety significance by the regional senior reactor analyst, this finding is considered an unresolved item (URI) 05000313/2004004-04, "Untimely Corrective Action to Fix Oil Leak Renders Emergency Diesel Generator Inoperable."

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

Selected Operator Workarounds: The inspectors reviewed the two below listed operator workarounds to (1) determine if the functional capability of the system or human reliability in responding to an initiating event is affected; (2) evaluate the effect of the operator workaround on the operator's ability to implement abnormal or emergency operating procedures; and (3) verify that the licensee has identified and implemented appropriate corrective actions associated with operator workarounds.

- Selected Operator Workarounds 1-04-09, Unit 1 Train A and B decay heat check valve back leakage

- CR ANO-2-2004-1624, Unit 2 high pressure safety injection pressurization system pump operation

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the five below listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly realigned, and deficiencies during testing were documented. The inspectors also reviewed the corrective action program to determine if the licensee identified and corrected problems related to post-maintenance testing.

- Week of August 9, 2004, Unit 2 EDG 2K-4A, reviewed Work Order Package 0004283802 for replacement of Cylinder 5 and 9 temperature elements

- August 26, 2004, Unit 1 EFW Pump P-7A, reviewed Procedure 1106.006, “Emergency Feedwater Pump Operation,” Supplement 12, “Steam Driven Emergency Feedwater Pump Test (Quarterly),” Revision 64, which was performed following maintenance on the turbine driven pump

- September 2, 2004, Unit 1 Decay Heat Pump P-34A, reviewed Procedure 1104.004, “Decay Heat Removal Operating Procedure,” Supplement 1, “Low Pressure Injection (Decay Heat) Pump and Components Quarterly,” Revision 71, which was performed following maintenance on the pump

- September 22, 2004, Unit 2 High Pressure Injection Pump 2P-89A, reviewed Procedure 2104.039, “HPSI System Operation,” Supplement 1, “2P-89A Quarterly Test,” Revision 42, which was performed following maintenance on the pump

- September 23, 2004, Unit 1 Reactor Building Spray Pump P-35A, reviewed Procedure 1104.005, “Reactor Building Spray System Operation,” Supplement 3, “RB Spray Pump P-35A Quarterly Test (Red Train),” Revision 42, which was performed following maintenance on the pump

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and Technical Specifications to ensure that the eight below listed surveillance activities demonstrated that the SSCs tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedural adherence; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated Technical Specification operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of ASME Code requirements; (12) updating of performance indicator data, (13) engineering evaluations, root causes, and bases for returning tested SSCs not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciator and alarm setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- September 5, 2003, alternate AC diesel generator 18 month surveillance test per Procedure 2104.037, Revision 6

- April 13, 2004, Unit 1, source range channel linear amplifier calorimetric calibration per Procedure 1304.055, Revision 12

- May 21, 2004, Unit 2, Containment Spray Pump 2P-35A Quarterly Test per Procedure 2104.005, Supplement 1, Revision 42

- May 27, 2004, Unit 1, EFW Steam Admission Valve CV-2663 stroke testing per Procedure 1106.006, Revision 64

- July 9, 2004, Unit 2, low pressure safety injection and refueling water tank motor-operated valve stroke testing per Procedure 2104.040, Revision 35

- July 11, 2004, Unit 2, service water valve quarterly stroke test performed per Procedure 2104.029, Revision 54

- July 15, 2004, Unit 1, Continuous Air Monitors RE-7460 and RE-7461 quarterly testing per Procedure 1304.181, Revision 8, (RCS leakage detection surveillance)

- July 27, 2004, Unit 2, Swing Inverter 2Y2224 periodic testing performed per Procedure/Work Plan 2416.046, Revision 3. During the performance of this procedure, the technicians increased the “Inverter Output Overvoltage Alarm,” setpoint per ER ANO-2003-0644-000 (Work Order Package 0038659, Revision 1) and replaced critical status lights per ER ANO-2003-0618-000 (Work Order Package 00035555, Revision 1). The installation of the new lights addressed existing problems of short bulb life and the inability of operators to replace burned bulbs

The inspectors completed eight samples.

b. Findings

Introduction. The inspectors identified an Apparent Violation of 10 CFR Part 50, Appendix B, Criterion XV, “Nonconforming Materials, Parts, or Components,” for the licensee's failure to establish controls to prevent a breaker with a loose connection from being installed in Unit 2.

Description. During a quarterly surveillance test on May 20, 2004, Unit 2 Containment Spray Pump 2P-35A failed to start. This was the first instance of this pump failing to start since the licensee replaced the 4160 VAC breaker in 2001. Licensee personnel conducted troubleshooting to diagnose the cause of the pump failure and found elevated resistance across the contacts for Relay LS-9 in the breaker's closing circuit. Convinced that this was the cause of the breaker failure, the licensee replaced Relay LS-9 and returned the breaker and pump to service. During postmaintenance testing, the breaker was cycled satisfactorily 11 times and the pump started with the breaker racked-in.

On June 3, 2004, engineering personnel contacted the breaker vendor, Siemens, to inform them of their findings with the high resistance across the contacts. The vendor refuted the licensee's finding stating that any resistance would have been burned through by the 250 volts DC supplied to the breaker's closing circuit during the start sequence. The vendor recommended that the licensee check other parts of the circuit to identify the cause of the failed breaker.

On August 9, 2004, the licensee racked out the containment spray pump breaker for further troubleshooting and discovered that a spade-lug connection leading to the anti-pump relay in the closing circuitry was loose. The spade was not completely inserted into the lug, giving intermittent elevated resistance readings to the relay technicians who were troubleshooting the breaker. The inspectors noted that the licensee delayed additional inspections of the breaker even though the vendor had provided information which contradicted their cause of the breaker's failure mechanism.

During conversations after the discovery, one licensee technician noted that he had discovered five or six similar loose connections while performing receipt inspections of this group of breakers in 2000. The inspectors questioned whether a condition report had been written to document the discovery of loose connections during the receipt inspection process. The licensee explained that the receipt inspection procedure for the breakers instructed the technicians to tighten loose connections as necessary. As a result, the technician simply inserted the spade into the lug for the loose connections he discovered and did not document the deficiency on the receipt inspection sheet. The technician did inform other technicians performing receipt inspections of the deficiency. Because the loose connections were not recorded individually, a deficiency report was not generated, and corrective actions to inspect all other spade-lug connections in the group of breakers was not initiated. As a result, a breaker with a loose connection was installed into the plant for the Unit 2 Containment Spray Pump 2P-35A.

The inspectors noted that Maintenance Action Item 26147 (used to inspect the breakers) required that all deficiencies be recorded. The inspectors concluded that the loose connections should have been documented. The inspectors noted that after the failure of the pump to start on May 21, 2004, the degraded circuit connection was not discovered and was left in place for 2 additional months, until August 9, due to licensee personnel incorrectly considering Relay LS-9 as the cause of the failure of the containment spray pump to start.

Analysis. The inspectors determined that this finding is more than minor because it is analogous to Example 5.c of Appendix E, “Examples of Minor Issues,” of Manual Chapter 0612, “Power Reactor Inspection Reports,” because a nonconforming component was installed in the plant and the system it was in was returned to service. Using the Phase 1 worksheets in Manual Chapter 0609, “Significance Determination Process,” the inspectors determined that the finding effected the mitigating systems and barrier integrity cornerstones. As a result, the inspectors performed a Phase 2 analysis 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 Phase 2 analysis determined that the finding was potentially of greater than Green safety significance. The inspectors assumed that the duration was greater than 30 days and that operations personnel would be able to recover the containment spray pump by starting it from the switchgear room. The dominate core damage sequences involved a loss of AC or DC busses, a failure of emergency feedwater, and a failure of containment spray recirculation. Specifically, the small break loss of coolant accident and stuck open relief valve sequences were most limiting. A review of the Phase 2 analysis and performance of a Phase 3 analysis by a regional senior reactor analyst is needed to determine the final safety significance of the finding.

This issue is not an immediate safety concern because on August 9, 2004, the licensee removed the Containment Spray Pump from service and repaired the loose connection, thereby restoring electrical continuity to the containment spray pump 2P-35A breaker

circuitry. This issue involved problem identification and resolution crosscutting aspects associated with maintenance technicians not identifying the cause of the breaker failure and not documenting deficiencies in the corrective action program.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XV, requires that licensees establish measures to control components which do not conform to requirements in order to prevent their inadvertent use. Contrary to the above, licensee personnel did not establish adequate measures during the breaker receipt inspection process in October 2000 to prevent breakers with loose circuit connections from being installed in the plant. As a result, the breaker was installed in the cubicle for the Unit 2 containment spray pump breaker in February 2001. Pending determination of the finding's final safety significance, this violation is being treated as Apparent Violation (AV), consistent with Section VI.A of the NRC Enforcement Policy: AV 05000368/2004004-05, "Failure to Identify and Correct a Loose Circuit Connection in Containment Spray Pump Circuitry."

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, plant drawings, procedure requirements, and Technical Specifications to ensure that the one temporary modification listed below was properly implemented. The inspectors (1) verified that the modification did not have an affect on system operability/availability; (2) verified that the installation was consistent with the modification documents; (3) ensured that the post-installation test results were satisfactory and that the impact of the temporary modification on permanently installed SSCs were supported by the test; (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings; (5) verified that appropriate safety evaluations were completed; and (6) examined drawings, procedures, and operations logs for temporary modifications that have not been so designated. The inspectors verified that the licensee identified and implemented any needed corrective actions associated with temporary modifications.

- Weeks of August 2 and 9, 2004, Unit 2 green train high pressure safety injection header, temporary alteration of a high pressure safety injection pressurization system. The pressurization system was evaluated under Engineering Request ER ANO-2000-3275-003.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

For the below listed drill and simulator-based training evolutions contributing to drill/exercise performance and emergency response organization performance indicators, the inspectors (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and protective action requirements development activities; (2) compared the identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and (3) determined whether licensee performance is in accordance with the guidance and acceptance criteria of NEI 99-02, "Regulatory Assessment Indicator Guidelines," Revision 2.

- September 15, 2004, the inspectors evaluated the licensee's performance in the Unit 2 simulator, emergency operating facility, and the technical support center during a quarterly emergency plan drill that involved a loss of lake level, loss of the emergency cooling pond, degradation of the service water system, and a reactor coolant system leak into the component coolant water system which resulted in the release of radioactivity from the containment building to the environment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors sampled licensee submittals for the two performance indicators listed below on both units for the period from July 1, 2003, through June 30, 2004. The inspectors verified (1) the accuracy of the performance indicator data reported during that period; and (2) used the performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Indicator Guidelines," Revision 2, to verify the basis in reporting for each data element.

Reactor Safety Performance Indicators

- Safety system unavailability, auxiliary feedwater system
- Safety system unavailability, residual heat removal system

The inspectors reviewed operator log entries, daily shift manager reports, plant computer data, CRs, maintenance action items, maintenance rule data, and performance indicator data sheets to determine whether the licensee adequately verified the performance indicators listed above. This number was compared to the number reported for the performance indicator during the past 3 quarters. Also, the inspectors interviewed licensee personnel responsible for compiling the information.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Annual Sample Review

a. Inspection Scope

The inspectors chose one issue for more in depth review to verify that licensee personnel had taken corrective actions commensurate with the significance of the issues. The issues and their bases for their selection are described below:

- The 10 CFR 50.65(a)(4) implementation procedure, COPD024, "Risk Assessment Guidelines," has had a number of revisions during the past quarter due to both NRC and licensee identified weaknesses and violations. CR ANO-C-2004-0548 documented the changes as a result of failing to reperform risk assessments due to changing external events (weather related issues).

When evaluating the effectiveness of the licensee's corrective actions for these issues, the following attributes were considered:

- Complete and accurate identification of the problem in a timely manner commensurate with its significance and ease of discovery

- Evaluation and disposition of operability and reportability issues

- Consideration of extent of condition, generic implications, common cause, and previous occurrences

- Classification and prioritization of the resolution of the problem commensurate with its safety significance
- Identification of root and contributing causes of the problem for significant conditions adverse to quality
- Identification of corrective actions which are appropriately focused to correct the problem
- Completion of corrective actions in a timely manner commensurate with the safety significance of the issue

b. Findings

The inspectors determined that the licensee's corrective actions in response to NCV 05000313/2004003-03, “Failure to adequately assess risk due to external conditions,” were incomplete. While the inspectors noted that the licensee had updated COPD024, “Risk Assessment Guidelines,” and both units’ natural emergencies procedures (Operating Procedures 1203.025 and 2203.008), the inspectors found that the revised procedures were still deficient because, even with the changes, the potential still existed for risk to not be re-evaluated based on changing weather conditions (See Section 1R13).

.2 Cross-References to Problem Identification and Resolution Findings Documented Elsewhere

Section 1R05 documents a condition where the licensee failed to identify and correct conditions adverse to safety in that carbon dioxide fire extinguishers were not being hydrostatically retested on a 5-year interval as required by NFPA 10 requirements.

Section 1R13 and 4OA2 documents a condition where operations and engineering personnel did not implement corrective actions to address the extent of condition from a previous maintenance rule noncited violation documented in NRC Inspection Report 05000313/2004003 and 05000368/2004003.

Section 1R15 documents a condition where the licensee did not take timely corrective actions to assure that oil leakage was repaired on the Unit 1 Emergency Diesel Generator K-4B.

Section 1R22 documents a condition where maintenance technicians did not document loose connections in circuitry associated with the breaker for the Unit 2 Containment Spray Pump 2P-35A or identify the cause of the breaker failure in a timely manner.

.3 Observations with the Substantive Crosscutting Issue in Problem Identification and Resolution

As a result of numerous findings dealing with the licensee's corrective action program (CAP), the NRC staff identified a substantive crosscutting issue in the area of problem identification and resolution during its annual assessment for inspections conducted in 2003. In this inspection quarter, inspectors made the following observations pertaining to the specific areas listed below, which were identified as areas with implementation problems.

Problem Identification and Entry into the CAP. The inspectors noted that the issue with Unit 2 Containment Spray Pump 2P-35A was never entered into the corrective action program or its counterpart for the licensee's receipt inspection program. As a result, a breaker with a loose connection was installed into the plant as described in Section 1R22.

Prioritizing and Evaluating Conditions in the CAP. The inspectors noted that a leaking oil condition from a fitting on the Unit 1 EDG K-4B was not adequately prioritized or evaluated which affected the reliability of the EDG as described in Section 1R15.

Implementing Effective Corrective Actions. The inspectors identified an example where a plan to ensure all fire extinguishers were adequately hydrostatically tested per NFPA code was not implemented and, therefore, the periodicity of these tests had lapsed as described in Section 1R05. Additionally, the inspectors identified an example where operations and engineering personnel did not implement corrective actions to address the extent of condition from a previous maintenance rule noncited violation documented in NRC Inspection Report 05000313/2004003.

4OA3 Event Followup (71153)

.1 (Closed) LER 05000313/2004001-01, Operation Prohibited by Technical Specifications due to an Undetected Inoperable Channel of Required Source Range Nuclear Instrumentation during Core Alterations Caused by a Signal Processing Unit Circuit Breaker Failure

a. Inspection Scope

The inspectors reviewed the LER, corrective action documents CR ANO-1-2004-0645 and CR ANO-1-2004-0989, Unit 1 station operating logs, plant procedures, and plant computer trends. This review verified that the cause of the April 29, 2004 source range nuclear neutron monitor failure was identified and corrective actions were appropriate. The monitor failure was caused by a faulty circuit breaker which provided power to the process panel that drives the source range instrument. The inspectors also reviewed the corrective action database for other past failures related to source range nuclear neutron monitors.

b. Findings

Introduction. A self-revealing Green NCV of Unit 1 Technical Specification 3.9.2 was identified due to an inoperable source range nuclear neutron monitor which reduced the number of operable instruments below the requirements of Technical Specifications during core alterations.

Description. On April 29, 2004, at 10:51 p.m. shortly after completion of core offload for Refueling Outage 1R18, operators discovered that one of two redundant trains of source range nuclear neutron monitors was inoperable. The operators reviewed plant computer historical data and determined the green train source range nuclear neutron monitor had failed at 10:52 a.m. on April 29, 2004. As a result, for approximately 11 hours, movement of spent fuel assemblies from the reactor vessel had occurred with only one of the required two source range nuclear neutron monitors operable. Operators stationed to monitor the source range instruments did not notice the failure of the green train instrument.

Analysis. 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 attributable to configuration control. 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 (Green) because it did not affect the licensee's ability to maintain reactor coolant system inventory, terminate a leak path, or recover decay heat removal.

Enforcement. Unit 1 Technical Specification 3.9.2, “Nuclear Instrumentation,” requires that one source range neutron nuclear monitor be operable in Mode 6. Additionally, Technical Specification 3.9.2 requires that one additional source range neutron nuclear monitor be operable during core alterations. Contrary to the above, on April 29, 2004, the licensee performed core alterations (removed fuel from the reactor vessel) with only one source range neutron nuclear monitor operable for 11 hours. Because the finding was determined to have very low safety significance and has been entered in the licensee's corrective actions program as CR ANO-1-2004-0989, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/2004004-06, “Core Alterations with Less than Two Operable Source Range Neutron Nuclear Monitors.”

.2 (Closed) LER 05000368/2002002-00, Automatic Actuation of the Reactor Protection System Caused by a Main Turbine Trip due to Failure of the Main Generator Reverse Power Relay Resulted in a Reactor Trip

a. Inspection Scope

The inspectors reviewed the LER and corrective action document CR ANO-2-2002-2173 to verify the cause of the December 19, 2002, Unit 2 reactor trip and that corrective actions were reasonable. The reactor trip was caused by a main turbine trip which resulted from the failure of the main generator reverse power relay. The inspectors reviewed plant parameters and verified that licensee staff properly implemented the appropriate plant procedures and that plant equipment performed as required. The inspectors also reviewed the cause of the sequence of events dating back to the original procurement of the failed relay and associated operational experience.

b. Findings

Introduction. A self-revealing Green finding was identified for an inadequate maintenance procedure which did not include vendor recommended maintenance for the Unit 2 main generator reverse power relay.

Description. The licensee installed General Electric (GE) Model GGP relays for their reverse power relays in Unit 2. These relays were designed to receive input from current and voltage transformers on the main generator output which in turn were designed to provide rotary motion of a vertical shaft. An arm containing a moving contact at its end was attached to the shaft using a clutch (essentially a set screw). Rotary action was designed to occur instantly upon sensing a reverse power condition.

On December 19, 2002, while the plant was operating at 100 percent rated thermal power, the reverse power relay inadvertently operated with no reverse power condition present, resulting in a Unit 2 reactor trip. Inspection of the relay identified that the clutch had been slipping. This slippage eventually wore the shaft's pivot bearing completely away and allowed the contact on the arm to close, which caused the relay to actuate on reverse power even though no reverse power condition existed.

Follow-up correspondence between GE and the licensee uncovered that the licensee had not been performing the clutch tightness test required by GE Document GEK-34117, "Polyphase Power Directional Relay for Anti-Motoring Protection." Consequently, maintenance personnel were not aware that the clutch on the relay was slipping. This GE document was used to develop master preventative Maintenance Procedure ANO PM-070, "Protective Relays," and the specific maintenance procedures for these reverse power relays. A review of these documents revealed that the clutch tightness check recommended by Document GEK-34117 was not included in the applicable ANO preventative maintenance engineering evaluation or maintenance procedures.

Analysis. This finding is greater 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," in that a procedural error caused a reactor trip. This finding affected the initiating events cornerstone. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because, although it resulted in a reactor trip, all mitigating systems remained available to the operators.

Enforcement. No violation of regulatory requirements occurred. The inspectors determined that the finding did not represent a noncompliance because it occurred on nonsafety secondary plant equipment. Licensee personnel entered this issue into the corrective action program as CR ANO-2-2002-2173: FIN 05000368/2004004-07, "Inadequate Maintenance Procedure for the Main Generator Reverse Power Relays."

.3 (Closed) LER 05000368/2004001-00, Wide-Range Containment Water Level Transmitter in the off Position Rendering One of Two Technical Specification Channels Inoperable

On March 16, 2004, a waste control operator found the power switch for one of the wide range containment water level transmitters in the off position. This rendered the corresponding Technical Specification required wide range containment water level indicator inoperable. During the investigation, the licensee determined that the transmitter had been secured on October 9, 2003, during the latter stages of the previous refueling outage and, therefore, had been secured greater than the allowed outage time per Technical Specification 3.3.3.6. The licensee determined that the most probable cause of the mispositioning was an accidental bump by an individual exiting the containment building. The inspectors reviewed CR ANO-2-2004-0551 and its associated root cause evaluation report and determined this finding constituted a violation of Unit 2 Technical Specification 3.3.3.6. The inspectors determined this violation to be of minor safety significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy, because the redundant channel was available, the containment sump level detection system was available, and the transmitter was located in an area that is easily accessible and; had the need arisen, an operator could have been dispatched to investigate and restore power. This LER is closed.

4OA5 Other Activities

1. Temporary Instruction 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants"

a. Inspection Scope

The inspectors collected the data specified in Phases I and II of the temporary instruction. The data was forwarded to the individuals identified in the temporary instruction for consolidation and assessment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

The maintenance rule inspector presented the inspection results of the maintenance effectiveness inspection to Mr. J. Forbes, Vice President, Operations, and other members of licensee's management staff on August 19, 2004. The licensee acknowledge the findings presented.

The operations inspectors presented the inspection results of the operations requalification inspection to Mr. J. Forbes, Vice President, Operations, and other members of licensee's management at the conclusion of the inspection on September 8, 2004. The licensee acknowledged the findings presented.

The resident inspectors presented the inspection results of the resident inspections to Mr. J. Forbes, Vice President, Operations, and other members of the licensee's management staff on September 28, 2004. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI.A of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

10 CFR 50.65(a)(4) requires, in part, that the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to this, while performing a routine risk assessment the licensee discovered they had not modeled the Unit 1 decay heat vault room coolers into their equipment out of service quantitative risk assessment program to assess plant risk, nor had they evaluated them by any qualitative means. Consequently, the licensee's risk assessments for maintenance activities which affected the decay heat vault room coolers were

inadequate. This condition is described in the corrective action program as CRs ANO-1-2004-1948, ANO-1-2004-1813, and ANO-1-2004-1283. This finding is of very low safety significance because one of the two coolers provides 100 percent cooling capability and one cooler was always available.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Berryman, Manager, Planning and Scheduling
J. Bradford, Supervisor, Nuclear Training
R. Byford, Training
S. Cotton, Manager, Training
S. Cupp, Supervisor, Simulator Training
J. Eichenberger, Manager, Corrective Actions and Assessments
C. Eubanks, General Manager, Plant Operations
J. Forbes, Vice President, Arkansas Nuclear One
F. Forrest, Manager, Operations, Unit 1
D. Fowler, Quality Assurance
R. Gordon, Manager, System Engineering
W. Greeson, Acting Manager, Engineering Programs and Components
A. Hawkins, Licensing Specialist
A. Heflin, Manager, Operations, Unit 2
P. Higgins, Supervisor, Nuclear Training
G. Hines, Maintenance Rule Coordinator
J. Hoffpauir, Manager, Maintenance
R. Holeyfield, Manager, Emergency Planning
D. James, Acting Director, Nuclear Safety Assurance
S. Kaufmann, Access Authorization, Fitness For Duty
J. Kowalewski, Director, Engineering
T. Mayfield, Supervisor, Training, Unit 2
J. Miller, Manager, Nuclear Engineering
K. Nichols, Manager, Design Engineering
P. Partridge, Manager, Technical Support
K. Perkins, Supervisor, System Engineering
S. Pyle, Licensing Specialist
R. Scheide, Licensing Specialist
C. Tyrone, Manager, Quality Assurance
F. Vanbuskirk, Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000313/2004004-04	URI	Untimely Corrective Action to Fix Oil Leak Renders Emergency Diesel Generator Inoperable (Section 1R15)
05000368/2004004-05	AV	Failure to Identify and Correct a Loose Circuit Connection in Containment Spray Pump Circuitry (Section 1R22)

Opened and Closed

05000313/2004004-01	NCV	Nonconservative Calculation of Design Basis Intake Structure Ventilation (Section 1R01)
05000368/2004004-02	NCV	Failure to Perform Required Hydrostatic Testing of Pressurized Fire Extinguishers (Section 1R05)
05000313/2004004-03 05000368/2004004-03	NCV	Failure to Adequately Assess Risk Due to External Conditions or HELB Doors Removed (Section 1R13)
05000313/2004004-06	NCV	Core Alterations with Less than Two Operable Source Range Nuclear Neutron Monitors (Section 4OA3)
05000368/2004004-07	FIN	Inadequate Maintenance Procedure for the Main Generator Reverse Power Relays (Section 4OA3)

Closed

05000368/2002002-00	LER	Automatic Actuation of the Reactor Protection System Caused by a Main Turbine Trip due to Failure of the Main Generator Reverse Power Relay Resulted in a Reactor Trip (Section 4OA3)
05000313/2004001-01	LER	Operation Prohibited by Technical Specifications due to an Undetected Inoperable Channel of Required Source Range Nuclear Instrumentation During Core Alterations Caused by a Signal Processing Unit Circuit Breaker Failure (Section 4OA3)
05000368/2004001-00	LER	Wide-Range Containment Water Level Transmitter in the off Position Rendering One of Two Technical Specification Channels Inoperable (Section 4OA3)

Discussed

None

LIST OF DOCUMENTS REVIEWED

In addition to the documents called out in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Section1R01: Adverse Weather Protection

Engineering Calculation

89-D-2001-08, "Intake Structure Ventilation Post Modification Evaluation With Worst Case Heat Load Under Accident Conditions," Revision 0

89-D-2001-09, "Unit 2 Intake Structure Environmental Temperature Study," Revision 0

93-D-5015-01, "Unit 1 Intake Structure Natural Convection," Revision 1

Operating Procedures

1104.050, "Turbine Building, Intake Structure, and Miscellaneous Ventilation," Revision 2
1203.012I, "Annunciator K10 Corrective Action," Revision 40

Section 1R04: Equipment Alignment

Operating Procedures

1104.004, "Decay Heat Removal Operating Procedure," Revision 71
2107.002, "ESF Electrical System Operation," Revision 16
2107.003, "Inverter and 120 VAC Electrical System Operation," Revision 19

Plant Drawings

—209 Sheet 4, Revision 14; —210 Sheet 1, Revision 139; and —232 Sheet 1, Revision 99

Section 1R05: Fire Protection

CRs

ANO-1-2004-1544 and ANO-C-2004-0755

Engineering Calculation

85-E-0053-15, Revision 45

Plant Documents

Arkansas Nuclear One Fire Hazards Analysis Report, Revision 8
ANO Pre-Fire Plan for Fire Zone 2136-I and 2119-H, Revision 1

Plant Drawings

FP-101, “Fire Zone Fuel Handling Floor Plan El. 404 '- 0" and 422' - 6",” Sheet 1, Revision 16

FP-105, “Fire Zone Plan Below Grade EL 335' - 0",” Sheet 1, Revision 18

FP-106, “Fire Zone Plan at Elev. 317' - 0" & Section B-B,” Sheet 1, Revision 12

FP-2103, “Fire Zones Intermediate Floor Plan at Elev. 368' - 0" and 372' 0",” Sheet 1, Revision 25

FP-2104, “Fire Zone Ground Floor Plan at Elev. 354' - 0",” Sheet 1, Revision 29

Section 1R06: Flood Protection Measures

Engineering Calculations

92-R-0024-01 and 92-R-0034-01

Plant Drawings

FP-105, “Fire Zone Plant Below Grade EL 335" - 0",” Sheet 1, Revision 18
FP-106, “Fire Zone Plant at Elev. 317' - 0" & Section B-B,” Sheet 1, Revision 12

Section 1R11: Licensed Operation Requalification Program

Operating Procedures

1903.010, “Emergency Action Level Classification,” Revision 37

Training Scenario

ES-2-023, “Dynamic Exam Scenario,” Revision 2

Biennial

Procedures:

DG-TRNA-202-CORETEST, “Simulator Core Reload Acceptance Test,” Revision 1
DG-TRNA-202-EXAMSEC, “Simulator Exam Security Guidelines,” Revision 0
DG-TRNA-202-SIMCONTROL, “Simulator Modification Control,” Revision 0
ENS-TQ-201, “Systematic Approach to Training Process,” Revision 3
ENS-TQ-202, “Simulator Configuration Control,” Revision 1

OP-1063008, “Operations Training Sequence,” May 29, 2003
OP-1064032, “Simulator Training,” November 20, 2003

Written Examinations

A2EXM-LOR-ANNUAL-RO-TEST 1
A2EXM-LOR-ANNUAL-RO-TEST 2
A2EXM-LOR-ANNUAL-RO-TEST 3
A2EXM-LOR-ANNUAL-RO-TEST 4
A2EXM-LOR-ANNUAL-RO-TEST 5
A2EXM-LOR-ANNUAL-RO-TEST 6
A2EXM-LOR-ANNUAL-SRO-TEST 1
A2EXM-LOR-ANNUAL-SRO-TEST 2
A2EXM-LOR-ANNUAL-SRO-TEST 3
A2EXM-LOR-ANNUAL-SRO-TEST 4
A2EXM-LOR-ANNUAL-SRO-TEST 5
A2EXM-LOR-ANNUAL-SRO-TEST 6

Static Scenarios (written examination)

SS-001, SS-003, SS-006, SS-008, SS-010, and SS-017

Dynamic Examination Scenarios

ES-2-008, Revision 2; ES-2-009, Revision 3; ES-2-010, Revision 4; ES-2-011, Revision 6; ES-2-013, Revision 3; ES-2-018, Revision 8; ES-2-023, Revision 2; ES-2-024, Revision 1; and ES-2-026, Revision 4

Job Performance Measures

A2JPM-RO-SFPFL, Revision 6
A2JPM-RO-EDDCG, Revision 3
A2JPM-SRO-EAL5, Revision 0
A2JPM-RO-CVCS7, Revision 4
A2JPM-RO-RCP02, Revision 4
A2JPM-RO-EFW02, Revision 10
A2JPM-RO-FWCS1, Revision 6
A2JPM-RO-SIT05, Revision 2
A2JPM-RO-EFW03, Revision 5
A2JPM-SRO-EAL2, Revision 0
A2JPM-RO-FPEM2, Revision 10
A2JPM-RO-2RS2, Revision 4
A2JPM-RO-AAC01, Revision 2
A2JPM-RO-CCWSA, Revision 9
A2JPM-RO-CPC02, Revision 1
A2JPM-RO-CVCS2, Revision 2

Training Evaluation Action Requests

2003-420 and 2004-146

Miscellaneous

Simulator Fidelity Report for 2003/2004
Annual Performance Testing Data for 2003
Plant Data from Loss of both Main Feedwater Pumps
Steady State Data
Transient Data
Core Performance Data

Section 1R12: Maintenance Effectiveness

CRs

ANO-1-1999-0109, ANO-2-2001-0622, ANO-2-2001-1404, ANO-1-2002-0066, ANO-1-2002-0428, ANO-2-2002-0005, ANO-2-2002-0389, ANO-2-2002-1574, ANO-C-2002-0151, ANO-C-2002-0395, ANO-C-2003-0640, and ANO-2-2004-0779

Operating Procedures

2107.002, “ESF Electrical System Operation,” Revision 16
2107.003, “Inverter and 120 VAC Electrical System Operation,” Revision 19

Biennial

CRs

ANO-2-2001-0092, ANO-1-2002-1155, ANO-1-2002-1191, ANO-1-2002-1489, ANO-2-2002-1102, ANO-1-2003-0062, ANO-1-2004-1964, and ANO-2-2004-1132

Operating Procedures

1202.005, “Inadequate Core Cooling,” Revision 4
1203.003, “Control Rod Drive Malfunction Action,” Revision 20
DC-121, “Maintenance Rule,” Revision 1
LI-102, “Corrective Action Process,” Revision 4

Miscellaneous

ALO-2004-00037, “Maintenance Rule Self-Assessment,” July 2, 2004

Maintenance Rule (a)(1) Systems, as of August 16, 2004

Maintenance Rule Scope, as of August 16, 2004

System Performance Criteria, August 10, 2004

"Entergy Nuclear South Maintenance Rule Desk Top Guide," Revision 1

"Entergy Nuclear South System Engineering Desk Guide," Revision 0

Engineering Report A-SE-2002-001-0, "ANO Units 1 & 2 and Structures - 2002 Maintenance Rule Periodic Assessment," approved October 22, 2003

Engineering Report A-SE-2004-001-0, "ANO Units 1 & 2 and Structures - 2003 Maintenance Rule Periodic Assessment," approved May 24, 2004

ANO Units 1 & 2 Availability and Reliability Data, through June, 2004

"U1 & U2 Joint Expert Panel Meeting," dated March 8, 2001

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

CRs

ANO-2-2004-1188, ANO-2-2004-1302, ANO-C-2004-1279, ANO-C-2004-1402, and ECH-2004-0307

Operating Procedures

1107.001, "Electrical System Operations," Revision 60
2107.001, "Electrical System Operations," Revision 48

Plant Documents

CE-P-05.07, "Data Analysis for At-Power PSA Models," Revision 0
COPD024, "Risk Assessment Guidelines," Change 11
COPD024, "Risk Assessment Guidelines," Change 12
COPD024, "Risk Assessment Guidelines," Change 13

Section 1R15: Operability Evaluations

CRs

ANO-C-2001-0018, ANO-C-2001-0678, ANO-C-2001-0698, ANO-C-2003-0360, ANO-2-2004-0011, ANO-2-2004-0779, ANO-2-2004-1235, and ANO-C-2004-0483

Operating Procedures

1025.063, "Control of Troubleshooting," Attachment 1, Revision 1

2104.037, "Alternate AC Diesel Generator Operations," Revision 7

2104.037, “Alternate AC Diesel Generator Operations,” Supplement 1, Revision 7

2304.102, “Unit 2 High Linear and High Log Power Levels Excore Safety Channel C,” Revision 47

2304.102, “Unit 2 High Linear and High Log Power Levels Excore Safety Channel C,” Supplement 2, Revision 47

Work Order Packages

00048303 01, 50284683 01, 50685110 01, and 50973125 01

Section 1R16: Operator Workarounds

CRs

ANO-1-2002-1853, ANO-1-2004-1817, ANO-1-2004-1832, ANO-1-2004-1974, ANO-2-2004-1061, ANO-2-2004-1118, ANO-2-2004-1120, ANO-2-2004-1388, ANO-2-2004-1558, and ANO-2-2004-1624

Operating Procedures

1104.004, “Decay Heat Removal Operating Procedure,” Revision 71
2104.039, “HPSI System Operation,” Revision 42

Section 1R19: Postmaintenance Testing

CRs

ANO-2-2004-0780

Operating Procedures

2304.134, “Unit 2 EDG 2K4A Instrumentation Calibration,” Sections 1 through 7, 8.10.2, and 9, Revision 11

Work Order Packages

00042838 02, 50243449 01, 50571411 01, 50965925 01, 50965964 01, 50966657 01, 50966693 01, 50966736 01, 50966740 01, 50966830 01, 50966878 01, 50971621 01, 50972991 01, 50972992 01, and 50973104 01

Section 1R22: Surveillance Testing

CRs

ANO-1-2004-0645, ANO-1-2004-0989, ANO-2-2004-1187, ANO-2-2004-1186, and ANO-2-2004-1200

Engineering Calculation

ANO-2003-0618-000 and ANO-2003-0644-000

Operating Procedures

1304.181, “Unit 1 RCS Radiation Leak Detection System Quarterly Test,” Revision 8

2104.029, “Service Water System Operations,” Revision 54

2104.037, “Alternate AC Diesel Generator Operations,” Revision 6

2104.040, “LPSI System Operations,” Revision 35

2416.046, “Unit 2 (2Y11, 2Y13, 2Y1113, 2Y22, 2Y24, and 2Y2224) Inverter Inspection, Test and Maintenance Instructions,” Revision 3

Work Order Packages

00035555 01, 00036437 01, 00038659 01, 50278828 01, 50336059 01, 50573018 01, 50747792 01, 50972347 01, and 50973055 01

Section 1R23: Temporary Plant Modifications

CRs

ANO-2-2004-0065, ANO-2-2004-0253, ANO-2-2004-0406, ANO-2-2004-0420, ANO-2-2004-0446, ANO-2-2004-0472, ANO-2-2004-0671, ANO-2-2004-0694, ANO-2-2004-0722, ANO-2-2004-0784, ANO-2-2004-1120, ANO-2-2004-1121, and ANO-C-2004-0597

ER

ANO-2000-3275-003

Operating Procedures

1000.028, “Control of Temporary Alterations,” Revision 23
2104.039, “HPSI System Operation,” Revision 42

Work Orders

50276366 01 and 50276364 01

Section 4OA2: Identification and Resolution of Problems

CRs

ANO-C-2004-0548

Operating Procedures

1015.047, “Condition Reporting Operability and Immediate Reportability Determinations,” Revision 1

1203.025, “Natural Emergencies,” Revision 19

2203.008, “Natural Emergencies,” Revision 9

4OA3: Event Followup

CRs

ANO-1-1998-0300, ANO-1-2004-0645, and ANO-1-2004-0989

Operating Procedures

1107.003, “Inverter and 120V Vital AC Distribution,” Revision 12
1203.021, “Loss of Neutron Flux Indication,” Revision 8
1502.004, “Control of Unit 1 Refueling,” Revision 34

Section 4OA7: Licensee-Identified Violations

CRs

ANO-1-1998-0358, ANO-1-2004-0645, and ANO-1-2004-1373

LIST OF ACRONYMS

ANO	Arkansas Nuclear One
AV	apparent violation
CAP	corrective action program
CFR	*Code of Federal Regulations*
CR	condition report
dpm	drops per minute
EDG	emergency diesel generator
EFW	emergency feedwater
ESF	engineered safety features
HELB	high energy line break
GE	General Electric
LER	licensee event report
NCV	noncited violation
NFPA	National Fire Protection Association
SSC	structure, system, or component
URI	unresolved item