



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-4005**

May 5, 2006

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

**SUBJECT: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT  
05000313/2006002 AND 05000368/2006002 AND EXERCISE OF  
ENFORCEMENT DISCRETION**

Dear Mr. Forbes:

On March 24, 2006, 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 March 28, 2006, 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.

The report documents one inspector-identified finding which was determined to be of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. Because the finding was entered into your corrective action program, the NRC is treating this violation as a noncited violation consistent with Section VI.A of the Enforcement Policy. Additionally, two findings of very low safety significance (one NRC-identified and one self-revealing) were granted enforcement discretion in accordance with the "NRC Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues." If you contest these 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

Entergy Operations, Inc.

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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/

David N. Graves, Chief  
Project Branch E  
Division of Reactor Projects

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

Enclosure:  
NRC Inspection Report 05000313/2006002 and 05000368/2006002  
w/Attachment: Supplemental Information

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Only inspection reports to the following:

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 S. O'Connor, OEDO RIV Coordinator (**SCO**)  
**ROPreports**  
 ANO Site Secretary (**VLH**)

SUNSI Review Completed:  DNG  ADAMS: / Yes No Initials: DNG \_\_\_\_\_  
 / Publicly Available  Non-Publicly Available  Sensitive / Non-Sensitive

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RIV:RI:DRP/E	RI:DRP/E	SRI:DRP/E	C:DRS/PSB	C:DRS/OB
JLDixon	ELCrowe	RWDeese	MPShannon	TGody
E-DNGGraves	E-DNGGraves	E-DNGGraves	LCCarson for	/RA/
04/25/06	05/3/06	05/1/06	05/4/06	04/27/06
C:DRS/EMB	C:DRS/PEB	ACES:SES	C:DRP/E	
JAClark	LJSmith	MVasquez	DNGGraves	
/RA/	/RA/	T-DNGGraves	/RA/	
4/2806	5/2/06	5/5/06	5/5/06	

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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Dockets: 50-313, 50-368  
Licenses: DPR-51, NPF-6  
Report: 05000313/2006002 and 05000368/2006002  
Licensee: Entergy Operations, Inc.  
Facility: Arkansas Nuclear One, Units 1 and 2  
Location: Junction of Hwy. 64W and Hwy. 333 South  
Russellville, Arkansas  
Dates: January 1 through March 24, 2006  
Inspectors: M. Brown, Project Engineer  
K. Clayton, Operations Engineer  
E. Crowe, Resident Inspector  
R. Deese, Senior Resident Inspector  
J. Dixon, Resident Inspector  
D. Dumbacher, Resident Inspector, Callaway  
T. Rhoades, Resident Inspector, Wolf Creek  
Approved By: David N. Graves, Chief, Project Branch E  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000313/2006002, 05000368/2006002; 01/01/06 - 03/24/06; Arkansas Nuclear One, Units 1 and 2; Integrated Resident and Regional Report; Fire Protection, Operability Evaluations, Other Activities.

This report covered a 3-month period of inspection by resident inspectors and a regional specialist inspector. One Green noncited violation was 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: Mitigating Systems

- Green. Four examples of an NRC identified noncited violation of Unit 1 License Condition 2.C.(8), "Fire Protection," and ANO Unit 2 License Condition 2.C.(3)(b), "Fire Protection," were identified for the failure of licensee personnel to ensure fire doors were latched. On various days in January 2006, these four failures led to the doors being degraded as fire barriers and degrading their fire confinement ability assumed in the fire hazards analyses. This issue was entered into the licensee's corrective action program as Condition Report ANO-C-2006-0067.

The finding is greater than minor because it is associated with the mitigating systems cornerstone attribute of protection against external factors and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the fire protection significance determination process, the finding is determined to have very low safety significance because the fire areas adjacent to the unlatched doors either were covered by an automatic suppression system, did not contain redundant equipment, or were only unlatched for a very short time. The cause of the finding is related to the crosscutting element of human performance in that licensee personnel did not ensure fire doors were being maintained latched and shut (Section 1R05).

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 95 percent rated thermal power while resolving emergency feedwater (EFW) initiation and control indication problems and operated at that power level until January 4, 2006, when power was increased to 98 percent rated thermal power. The unit achieved 100 percent rated thermal power on January 14 and operated at that power level for the rest of the inspection period.

Unit 2 began the inspection period at 100 percent rated thermal power and operated at that power level throughout the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Readiness for Seasonal Susceptibilities

###### a. Inspection Scope

The inspectors completed one review of the licensee's readiness for seasonal susceptibilities involving low temperatures. The inspectors: (1) reviewed plant procedures, the Updated Final Safety Analysis Report (USFAR), and Technical Specifications (TSs) to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the three systems listed below to ensure that adverse weather protection features (heat tracing, space heaters, weatherized enclosures, temporary chillers, etc.) were sufficient to support operability including the ability to perform safe shutdown functions; (3) evaluated operator staffing levels to ensure the licensee could maintain the readiness of essential systems required by plant procedures; and (4) reviewed the corrective action program (CAP) to determine if the licensee identified and corrected problems related to adverse weather conditions.

- January 17-18, 2006, Units 1 and 2, alternate AC diesel generator, service water, and engineered safety feature (ESF) DC electrical systems

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

###### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04)

##### Partial Walkdown

The inspectors: (1) walked down portions of the four 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 UFSAR and CAP to ensure problems were being identified and corrected.

- January 11, 2006, Unit 2, auxiliary feedwater system
- January 18, 2006, Unit 2, Emergency Diesel Generator 2K-4B
- January 24, 2006, Unit 1, EFW system
- February 22-23, 2006, Unit 2, service water system

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

##### b. Findings

No findings of significance were identified.

#### 1R05 Fire Protection (71111.05)

##### Quarterly Inspection

The inspectors walked down the six below listed plant areas to assess the material condition of active and passive fire protection features and their operational lineup and readiness. 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 and that access to manual actuators was unobstructed; (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 that the compensatory measures were commensurate with the significance of the deficiency; and (7) reviewed the UFSAR to determine if the licensee identified and corrected fire protection problems.

- January 11, 2006, Unit 2, Fire Zone 2100-Z, south switchgear room
- January 11, 2006, Unit 2, Fire Zone 2101-AA, north switchgear room
- January 27, 2006, Unit 2, Fire Zone, 2155-A, steam pipe room



- February 1, 2006, Unit 1, Fire Zone 10-EE east decay heat removal pump room
- February 3, 2006, Unit 2, Fire Zone 2093-P Emergency Diesel Generator 2K-4A room
- February 3, 2006, Unit 2, Fire Zone 2094-Q Emergency Diesel Generator 2K-4B room

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

Introduction. The inspectors identified four examples of a Green noncited violation of the ANO license specified fire protection program when the licensee failed to ensure fire doors were properly closed and latched, thereby, degrading the effectiveness of four fire barriers.

Description. On January 10, 2006, a licensee system engineer touring the Unit 2 auxiliary building noted that Door 269 was found unlatched and slightly opened. The engineer shut and properly latched the door and initiated Condition Report (CR) ANO-2-2006-0034. In this CR, the engineer noted that the door closing mechanism was not providing sufficient force to close the door when released. Door 269 is a 3-hour rated fire door which separates the green Train 4160V ESF Switchgear 2A4 (Room 2100) and the red Train 4160V ESF Switchgear 2A3 (Room 2101).

In response to this CR, the inspectors performed a fire protection walkdown on January 11, 2006. When the inspectors approached Door 269, the inspectors discovered that it was again unlatched. The inspectors closed and latched the door and reported the condition to the shift manager. The licensee wrote CR ANO-C-2006-0051.

The inspectors discovered Door 268 unlatched during a follow-up visit to Door 269 on January 13, 2006. Door 268 is a 3-hour rated fire door which separates green Train 4160V ESF Switchgear 2A4 (Room 2100) the access corridor to the emergency diesel generator and ESF switchgear rooms (Room 2104). The inspectors closed and latched the door and reported the condition to the operations management. The licensee wrote CR ANO-2-2006-0043.

In response, the licensee performed a complete check of fire door deficiencies on January 14-15, 2006, and documented the deficiencies in the licensee's CAP. As a result, the licensee wrote CR ANO-C-2006-0067 which documented the numerous deficiencies found during the licensee's inspections of doors. Additionally, the licensee sent out a site-wide announcement via company e-mail to heighten the awareness of this issue. Finally, the licensee had first line supervisors reinforce this training in the morning meetings.

The inspectors discovered Door 39 unlatched on January 27, 2006, during a routine plant tour. Door 39 is a 3-hour rated fire door which separates the red train EDG (Room 87) and the green train EDG (Room 86). The inspectors closed and latched the door and reported the condition to the shift manager. The licensee wrote CR ANO-C-2006-0124.

During a routine tour of Unit 1 on January 30, 2006, the inspectors discovered Door 51, a 3-hour rated fire door unlatched which separates the red train ESF battery (Room 119) and the red train ESF battery (Room 109) chargers and inverters. The inspectors closed and latched the door and reported the condition to the shift manager. The licensee wrote CR ANO-1-2006-0150.

The licensee then took further corrective action to discover why doors were still being discovered opened. As part of this corrective action, the licensee set up surveillance cameras on several high traffic doors to observe personnel actions when passing through doors. The licensee observed that only approximately 30 percent of personnel were checking to ensure fire doors were latched after passing through the doors. The inspectors reviewed licensee documentation and discovered that general employee training gave plant personnel guidance to ensure fire doors were latched upon passing through the doors. Also, the inspectors noted that each of the fire doors had a note painted on it to ensure the fire doors were closed. The licensee then took further action to reinforce management expectations to ensure that fire doors were latched after passing through them through additional site communications and standdown meetings.

Analysis. The performance deficiency associated with this finding involved licensee personnel not ensuring fire doors were latched after passing through the doors. The finding is greater than minor because it is associated with the mitigating systems cornerstone attribute of protection against external factors and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding is assumed to degrade fire protection defense-in-depth strategies involving barriers, therefore, the significance of the finding is determined by using Appendix F, "Fire Protection Significance Determination Process," of Manual Chapter 0609. Using the Phase 1 Worksheet of Appendix F, the examples were determined to represent moderate degradation of fire confinement. Two of the examples of unlatched fire doors were determined to have very low safety significance because they met the Phase 1 qualitative screening criteria for fire confinement findings. Door 39 and Door 51 met the Phase 1 qualitative screening criteria for fire confinement findings. The Door 39 example was determined to be of very low safety significance because a nondegraded automatic full area water-based fire suppression system was present in the exposing area. The Door 51 example was determined to have very low safety significance because the inspectors determined that the exposed fire area contained no potential damage targets that were unique from those in the exposing fire area. The last two examples, Doors 268 and 269, were determined to have very low safety significance because the licensee met the Phase 1 quantitative screening criteria. The inspectors extrapolated a 1-hour fire duration which was conservatively consistent with an hourly fire watch paired with applicable generic fire area frequencies to make this determination. The cause of the finding is related to the crosscutting element of human

performance in that licensee personnel did not ensure fire doors were latched after passing through them.

Enforcement. ANO Unit 1 License Condition 2.C.(8), "Fire Protection," and ANO Unit 2 License Condition 2.C.(3)(b), "Fire Protection," states, in part, that Energy Operations, Inc. shall implement and maintain all provisions of the approved fire protection program. "ANO Unit 1 and Unit 2 - Fire Hazards Analysis," Revision 9, is part of the ANO Units 1 and 2 fire protection program. Section 6.4.5, "Fire Barriers, Seals, and Penetrations," of the Fire Hazards Analysis states, in part, that at ANO, openings in barrier walls have been protected with doors with a rating equivalent to that of the barrier. Contrary to this, on four separate occasions in January 2006, licensee personnel failed to assure that openings in the fire barrier walls were protected with doors with a rating equivalent to that of the barriers. Specifically, Doors 39, 51, 268, and 269 were unlatched which made the fire door inoperable and the fire barrier rating to less than 3 hours. The corrective actions to restore compliance included immediately ensuring the doors were properly closed and latched and communicating site-wide expectations for ensuring fire doors are latched. Because the finding is of very low safety significance and has been entered into the licensee's CAP as CR-ANO-C-2006-0067, this violation is being treated as an NCV consistent with Section VI.A of the Enforcement Policy: NCV 05000313/2006002-01; 05000368/2006002-01, "Failure to ensure fire doors were latched."

#### 1R06 Flood Protection Measures (71111.06)

##### Semi-annual Internal Flooding

###### a. Inspection Scope

The inspectors: (1) reviewed the UFSAR, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving external and internal flooding; (2) reviewed the UFSAR and CAP to determine if the licensee identified and corrected flooding problems; (3) inspected underground bunkers/manholes to verify the adequacy of (a) sump pumps, (b) level alarm circuits, (c) cable splices subject to submergence, and (d) drainage for bunkers/manholes; (4) verified that operator actions for coping with flooding can reasonably achieve the desired outcomes; and (5) walked down the below listed area to verify the adequacy of: (a) equipment seals located below the flooding, (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.

- January 31 through March 8, 2006, Unit 1, east decay heat removal pump room

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

###### b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

Quarterly Review

The inspectors observed testing and training of senior reactor operators and reactor operators to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. Training Scenario A2SPGLOR060301, "Loss of Offsite Power / Natural Circulation Cooldown," Revision 0, and involved operator response to degrading grid conditions and eventual loss of offsite power due to simulated tornadic activity in the area.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

Biennial Review

The inspector reviewed the simulator annual performance test book for 2005, which documented all annual tests that were conducted on October 11, 2005, using ANS/ANSI 3.5 -1998, "Nuclear Power Plant Simulators for Use in Operator Training and Examination," as committed to by the licensee in their configuration management system Procedure "DG-TRNA-015-SIMCONTROL." The purpose of this review was to determine if the simulator was capable of supporting initial examinations, supporting reactivity and control manipulations, and supporting requalification training required for all licensed operators. The inspector discussed facility operating events with the resident staff including the rod drop event on September 8, 2005. The inspector verified that the simulator core load used in the current training cycle was the same as the core load in the plant (Cycle 18). Documents reviewed during the inspection are listed in the back of this report.

The inspector interviewed one instructor, two reactor operators, two senior reactor operators, and one simulator engineer for feedback regarding the fidelity of the simulator, the simulator discrepancy reporting system effectiveness, and training on differences between the simulator and the plant. The inspector reviewed several program documents that described the overall simulator program and how management groups, such as the simulator review board, coordinated discrepancy priorities and their subsequent repair decisions such as cost versus training impact and major model upgrades in order to enhance training on the emergency operating procedures.

Three transient tests and one scenario (Station Blackout) were run on the simulator with data capture enabled in order to verify data collected was an accurate representation of the test data from the October 2005 annual tests and also as a verification of reasonable model performance based on the current design of the plant. These tests were: (1) Dual Feed Pump Trip-Transient Test Two; (2) Design Basis Loss of Coolant Accident with Subsequent Loss of Off-Site Power-Transient Test Eight; and (3) Slow Primary Depressurization to Saturation Conditions in the Primary - Transient Test Ten.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

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 SSC functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSC issues reviewed under the requirements of the Maintenance Rule, 10 CFR Part 50, Appendix B, and TSs.

- February 3-10, 2006, Unit 1, EFW initiation and control
- March 7-14, 2006, Unit 2, EFW

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two 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 four below listed assessment activities to verify: (1) 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) that 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) that the licensee identified and corrected problems related to maintenance risk assessments.

- January 30 through February 3, 2006, Unit 2, planned maintenance for the week
- February 20-24, 2006, Unit 1, planned maintenance for the week

- February 20-24, 2006, Unit 2, planned maintenance for the week
- March 19-24, 2006, Unit 1, planned maintenance for the week

#### Emergency 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 emergency 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 UFSAR to determine if the licensee identified and corrected risk assessment and emergency work control problems.

- February 8-10, 2006, Unit 1, Inverter Y-28 equipment failure

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

#### b. Findings

No findings of significance were identified.

### 1R15 Operability Evaluations (71111.15)

#### a. Inspection Scope

The inspectors: (1) reviewed plant 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 UFSAR 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 TSs; (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.

- September 6, 2005, Unit 1, potential leakage from the service water and fire water systems
- October 5, 2005, Unit 1, discovery of oil in the reactor building sump
- January 19, 2006, Unit 1, failure of "A" decay heat cooler E-35A bypass valve to properly stroke during surveillance testing



- January 27, 2006, Unit 2, Emergency Diesel Generator 2K-4A abnormal cylinder temperatures
- February 8-9, 2006, Unit 2, failure of ESFs actuation system matrix power Supply 21 in the plant protection system Channel A
- February 13, 2006, Unit 1, failures of the turbine-driven EFW pump steam admission Valves SV-2613 and SV-2663

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

Introduction. The inspectors reviewed a self-revealing violation of 10 CFR Part 50, Appendix R, Section III.O, for the failure of the Unit 1 reactor coolant pump oil collection system to collect oil leakage from the reactor coolant pump motor. The NRC is exercising enforcement discretion in accordance with the "NRC Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues."

Description. During Operating Cycle 19, the licensee added approximately 77.5 gallons of lubricating oil to the upper oil reservoir of Unit 1 reactor coolant Pump P-32C. On October 4, 2005, the licensee shutdown Unit 1 for a refueling outage and performed an inspection of the reactor coolant pump oil collection system. The licensee discovered that reactor coolant oil collection Tank T-90 contained 42 gallons of oil. This tank collected oil from the oil collection systems of reactor coolant Pumps P-32C and P-32D. The licensee investigated the 35.5 gallon discrepancy between the amount of oil added to the pump and the amount in Tank T-90. The licensee determined the reactor building sump contained approximately 11 gallons of oil and approximately 4 gallons of oil were discovered in the following areas: containment floor, inside structural components of the pump and on surrounding containment structure components. The licensee deduced that the 20.5 gallons of missing oil had been transferred from the reactor building sump to the auxiliary building sumps or clean waste receiving tank.

The licensee inspected the oil collection system for reactor coolant Pump P-32C and discovered leakage through oil collection system subcomponents and leakage through gaps between the neoprene band and the oil collection system trays on the motor housing. The licensee performed a lower tier apparent cause evaluation which concluded that aging of the oil collection system elastomeric components coupled with mechanical stresses was the apparent cause of the failure of the oil collection system to collect oil which leaked from the reactor coolant pump motor. Prior to restarting the unit, the licensee completed repairs to the system, made modifications to channel oil to discrete locations of the oil collection system, and conducted testing to verify that the repairs and modifications were satisfactory.

Analysis. The inspectors considered the failure of the reactor coolant system oil collection system to capture all oil leakage from the reactor coolant pump motor a performance deficiency. The inspectors determined the failure to be more than minor

because it affected the protection against external factors attribute of the reactor safety initiating events cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Appendix F, "Fire Protection Significance Determination Process," in Manual Chapter 0609, "Significance Determination Process," the finding was determined to be of very low safety significance because the performance deficiency was determined to be a low degradation of the licensee's fire prevention and administrative controls because the potential for the oil to soak insulation or contact a hot surface was very low.

Enforcement. 10 CFR Part 50, Appendix R, Section III.O, "Oil Collection System for Reactor Coolant Pump," states, in part, that the reactor coolant pump shall be equipped with an oil collection system if the containment is not inerted during normal operation and shall be capable of collecting lube oil from all potential pressurized and nonpressurized leakage sites in the reactor coolant pump lube oil systems. Contrary to the above, the oil collection system for Unit 1 reactor coolant Pump P-32C failed to collect leakage from the pump's motor during Operating Cycle 19. The licensee included this condition in the CR program as CR ANO-1-2005-1434. Because the licensee submitted a letter committing to transition to 10 CFR 50.48(c), "National Fire Protection Association Standard NFPA 805" by December 31, 2005, the NRC granted enforcement discretion in accordance with the "NRC Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues," section of the NRC Enforcement Policy.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the six 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 UFSAR to determine if the licensee identified and corrected problems related to postmaintenance testing.

- October 26, 2005, Unit 1, EFW turbine-driven pump steam admission Valve SV-2663 rebuild
- December 21, 2005, Unit 1, EFW turbine-driven pump remote electronic governor repairs
- January 14, 2006, Unit 1, EFW initiation and control system setpoint change



- February 1, 2006, Unit 2, EFW Pump 2P-7A corrective maintenance
- February 23, 2006, Unit 1, high pressure injection Pump P-36A corrective maintenance
- March 6, 2006, Unit 1, service water outlet isolation Valve CV-3815 breaker repairs

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and TSs to ensure that the five below listed surveillance activities demonstrated that the SSC's 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) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated TS 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) annunciators and alarms setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- January 11, 2006, Unit 2, EFW Pump 2P-7A overspeed trip test
- January 31, 2006, Unit 2, atmospheric dump Valve 2CV-0305
- February 1, 2006, Unit 2, auxiliary feedwater Pump 2P-75
- February 3, 2006, Unit 2, high pressure safety injection Pump 2P-9C (inservice test)
- March 20-24, 2006, Unit 1, reactor coolant system leak detection

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the UFSAR, plant drawings, procedure requirements, and TSs to ensure that the one below listed temporary modifications were 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, and (5) verified that appropriate safety evaluations were completed. The inspectors verified that the licensee identified and implemented any needed corrective actions associated with temporary modifications.

- February 5-7, 2006, Unit 1, high energy line break Door 62

Documents reviewed by the inspectors are listed in the attachment.

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 one below listed drills and simulator-based training evolutions contributing to drill/exercise performance, emergency response organization, and 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 of the NEI 99-02, "Voluntary Submission of Performance Indicator Data," acceptance criteria.

- March 22, 2006, Unit 1, emergency response organization drill involving an intersystem loss-of-coolant accident that results in an offsite release initiated from the Unit 1 simulator and activating the Technical Support Center, Emergency Operations Facility, the Operations Support Center, and the Alternate Emergency News Center.

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 three performance indicators listed below for the period from January 1, 2004, to December 31, 2005, for Units 1 and 2. The definitions and guidance of Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline, Revision 2, were used to verify the licensee's basis for reporting each data element in order to verify the accuracy of PI data reported during the assessment period. The inspectors reviewed licensee event reports, monthly operating reports, and operating logs as part of the assessment. Licensee performance indicator data were also reviewed against the requirements of Procedure EN-LI-114, "Performance Indicator Process," Revision 0.

- Unplanned scrams per 7,000 critical hours
- Unplanned scrams with loss of normal heat removal
- Unplanned power changes per 7,000 critical hours

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program. This assessment was accomplished by reviewing (work orders, CRs, etc.) and attending corrective action review and work control meetings. The inspectors: (1) verified that equipment, human performance, and program issues were being identified by the licensee at an appropriate threshold and that the issues

were entered into the corrective action program; (2) verified that corrective actions were commensurate with the significance of the issue; and (3) identified conditions that might warrant additional follow-up through other baseline inspection procedures.

#### 4OA5 Other Activities

##### .1 (Closed) Unresolved Item 05000313/2005004-01, "Failure to Comply with Licensing Basis for EFW Pump Room Fire Sprinklers"

Introduction. The inspectors identified a violation of very low safety significance of 10 CFR Part 50, Appendix R, Section III.G.2, for the Unit 1 EFW pump room fire sprinklers not being in compliance with the licensing basis. This violation was granted enforcement discretion.

Description. On June 30, 2005, the inspectors conducted a fire protection inspection of the Unit 1 EFW pump room (Fire Zone 38-Y). In this effort, the inspectors noted that the turbine-driven and motor-driven EFW pumps and cables share a common room with as little as approximately 4 feet of separation. The inspectors then reviewed the licensee's commitment for train separation in Fire Zone 38-Y, Unit 1 EFW pump room. The inspectors discovered that, since the licensee could not demonstrate train separation per 10 CFR Part 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," for the as built configuration, the licensee requested and was granted an exemption from the National Fire Protection Association (NFPA) Code. Some of the requirements from the granted exemption included: (1) a 1-hour fire wrap around the electrical cables of the turbine-driven pump, (2) a partial seismic block wall between the two pumps, and (3) a fire sprinkler system per NFPA 15 (1985 Edition) around the turbine-driven pump.

NFPA 15 defined a water spray system as a normally open sprinkler head. Contrary to this, the inspectors noted that the licensee's installed sprinkler system had frangible bulb sprinkler heads installed. The licensee lacked supporting documentation to show that the installed sprinkler system met NFPA 15, or that a deviation to the NFPA code had been evaluated regarding the sprinkler heads being frangible bulb type (with a temperature rating of 250EF) and the sprinkler heads being only 6 feet off the ground under an approximately 15 foot ceiling. Additionally, the licensee discovered that the sprinkler heads themselves were not orientated per the design change package, and the location and direction of the sprinkler heads did not match the design drawing. Hence, the inspectors concluded that the installed sprinkler system did not satisfy NFPA 15 (1985 Edition) requirements. The licensee contracted an NFPA code expert to review and determine the status of the installed sprinkler system. The contractor concluded that the system did not satisfy the requirements of NFPA 15 because of the frangible bulb sprinkler heads, but did determine that the installed fire sprinkler system will extinguish the postulated fire in the area.

Analysis. The inspectors determined that the failure to install the EFW pump room fire sprinkler system in accordance with NFPA 15 is a violation. The inspectors determined that this violation is more than minor because it affected the design control attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Using the Manual Chapter 0609,

"Significance Determination Process," Phase 1 Worksheet, the violation is assumed to degrade fire protection defense-in-depth strategies involving suppression, therefore, the significance of the finding is determined by using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." The licensee's evaluation of the difference in the NFPA code requirements and the installed system stated that the automatic suppression system installed to protect the turbine-driven EFW pump did not meet the requirements of NFPA 15, but the sprinkler system would be expected to actuate and provide adequate coverage for the types of fires postulated in the area. Therefore, applying this assessment to Appendix F, "Fire Protection Significance Determination Process" in NRC Manual Chapter 0609, "Significance Determination Process," the violation was determined to be of very low safety significance because the noncompliance was a low degradation of a fixed fire protection system.

Enforcement. Paragraph 2 of 10 CFR Part 50, Appendix R, Section III.G.2, "Fire Protection of Safe Shutdown Capability," delineates the requirements for redundant equipment cable separation. The licensee could not comply with this requirement and requested that the NRC grant an exemption to this requirement. The exemption states, in part, that the licensee install a fire suppression system around the turbine-driven EFW pump per NFPA 15 (1985 Edition). Contrary to this, the licensee did not install a fire sprinkler system around the turbine-driven EFW pump that was built in accordance with NFPA 15 (1985 Edition). The licensee included this condition in their CR program as CR ANO-1-2005-0954. Because the licensee submitted a letter stating their intent to transition to 10 CFR 50.48(c), "National Fire Protection Association Standard NFPA 805" by December 31, 2005, the NRC is exercising enforcement discretion in accordance with the "NRC Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues."

.2 (Closed) Unresolved Item 05000313/2005004-02, "Absence of Integrated Control System (ICS) Relay Room Fire Sprinklers"

During a fire protection inspection July 12, 2005, NRC inspectors identified the Unit 1 ICS relay room, which was contained in Fire Zone 97-Y, did not have an installed fire suppression system as described in the licensee's fire hazard analysis. The NRC inspectors reviewed documents provided by the licensee related to routing of safety-related cables, evaluated fire detection and suppression contained in adjacent areas of Fire Zone 97-Y, and reviewed the licensee's corrective actions. The inspectors determined this issue was minor because it was a nonsignificant dimensional discrepancy. The inspectors determined that no safe shutdown cables passed through the ICS relay room, adequate fire detection existed in the ICS relay room and in adjacent areas, adjacent areas contained adequate fire suppression equipment, and the licensee had revised the fire hazards analysis to reflect that Fire Zone 97-Y contained partial fire suppression and that this room did not contain fire suppression equipment.

4OA6 Meetings, Including Exit

The inspector debriefed the licensed operator requalification inspection results with Mr. R. Byford, Acting Training Manager, and other members of the licensee's staff at the conclusion of the inspection on February 23, 2006. A telephonic exit was held with Mr. Byford on March 20, 2006.

The resident inspectors presented the inspection results of the resident inspections to Mr. T. Mitchell, Acting Vice President, Operations, and other members of the licensee's management staff on March 28, 2006, and again with Mr. J. Kowalewski, Engineering Director, on April 6, 2006.

The licensee acknowledged the findings presented. The inspectors noted that while proprietary information was reviewed, none would be included in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

R. Barnes, Manager, Planning and Scheduling  
S. Bennett, Project Manager, Licensing  
B. Berryman, Manager, Unit 1 Operations  
E. Blackard, Supervisor, Mechanical Design Engineering  
J. Browning, Manager, Unit 2 Operations  
R. Byford, Acting Training Manager  
S. Cupp, Simulator Supervisor  
J. Eichenberger, Manager, Corrective Actions and Assessments  
J. Forbes, Vice President, Operations  
W. Greeson, Supervisor, Engineering Programs and Components  
J. Hoffpauir, Manager, Maintenance  
R. Holeyfield, Manager, Emergency Planning  
D. James, Manager, Licensing  
W. James, Manager, Alloy 600 Group  
J. Kowalewski, Director, Engineering  
R. Kowalewski, Manager, Technical Support  
D. Lomax, Manager, Dry Fuels  
T. Marlow, Director, Nuclear Safety Assurance  
R. Martin, Unit 1 Operations Training Supervisor  
T. Mayfield, Unit 2 Operations Training Supervisor  
J. Miller, Manager, Systems Engineering  
T. Mitchell, General Manager, Plant Operations  
D. Moore, Manager, Radiation Protection  
K. Nichols, Manager, Design Engineering  
R. Puckett, Supervisor, Fire Protection  
S. Pyle, Licensing Specialist  
C. Reasoner, Manager, Engineering Programs and Components  
R. Russell, Simulator Engineer  
R. Scheide, Licensing Specialist  
J. Sigle, Assistant Operations Manager  
C. Tyrone, Manager, Quality Assurance

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

05000313/2006002-01; NCV Failure to ensure fire doors were latched (Section 1R05)  
05000368/2006002-01

Closed

05000313/2005004-01 URI Failure to Comply with Licensing Basis for EFW Pump Room Fire Sprinklers (Section 4OA5)  
05000313/2005004-02 URI Absence of ICS Relay Room Fire Sprinklers (Section 4OA5)

Discussed

None

**LIST OF DOCUMENTS REVIEWED**

In addition to the documents referred to 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:

Section 1R04: Equipment Alignment

CRs

ANO-2-2005-2343 ANO-2-2005-2357 ANO-2-2005-2565  
ANO-2-2005-2344 ANO-2-2005-2373 ANO-2-2006-0018  
ANO-2-2005-2354 ANO-2-2005-2436

Plant Drawings

M-204 Sheet 3, Revision 30 M-206 Sheet 1, Revision 123  
M-204 Sheet 6, Revision 17 M-212 Sheet 2, Revision 58

Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
1106.006	Emergency Feedwater Pump Operations	65
2104.036	Emergency Diesel Generator Operations	49

Section 1R05: Fire Protection

Plant Drawing

FP-2103, Sheet 1, Revision 6

Procedure

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Fire Hazards Analysis	9
	A-2	Attachment



Section 1R06: Flood Protection Measures

CRs

ANO-1-2002-1371                      ANO-1-2003-0761                      ANO-1-2006-0323  
ANO-1-2002-1441                      ANO-1-2005-1846

Miscellaneous

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
A1-NE-2003-002	Leak Rate Acceptance Criteria for ABS-13 and 14	0
ULD-0-TOP-17	ANO Flooding Topical	0

Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
COPD-024	Risk Assessment Guidelines	17
1203.025,	Natural Emergencies	20
1104.004,	Decay Heat Removal Operating Procedure	72
1202.010	ESAS	5

Work Orders

50966581 01                      50981188 01  
50966618 01                      50987784 01

Section 1R11: Licensed Operator Requalification Program

Open and Closed Simulator Discrepancy Reports from January 2004 through December 2005

Nuclear Management Manual "Simulator Configuration Management," EN-TQ-202

WesTrain White paper on Core Performance Testing Requirements

Core physics test packages for simulator, Cycle 18

Plant Physics Data Book, Cycle 18

Completed SBT test package for Reactivity credit used on 2005 exam (A2-SPG-LOR050202)

Simulator Annual Performance Test book for 2005

Simulator Configuration Management Procedure, "DG-TRNA-015-SIMCONTROL"

Simulator Transient Testing Procedure

Plant Mod summary from January 2004 through December 2005

Simulator differences list

Completed SBT test package for various RO transients (A2-SPG-RO-TRANS)

List of all current exceptions to ANS/ANSI 3.5 - 1998, "Nuclear Power Plant Simulators for Use in Operator Training and Examination"

Operator licensing tracking system active operator licenses (R4 OLTS report)

Current operator license list from ANO

Section 1R12: Maintenance Effectiveness

CRs

ANO-1-2005-0470	ANO-2-2004-0403	ANO-2-2005-0466
ANO-1-2005-0559	ANO-2-2004-0533	ANO-2-2005-1151
ANO-1-2005-1466	ANO-2-2004-0926	ANO-2-2005-1319
ANO-1-2005-3075	ANO-2-2004-1714	
ANO-1-2006-0123	ANO-2-2004-1743	
ANO-1-2006-0135	ANO-2-2004-2195	
ANO-1-2006-0163	ANO-2-2005-0298	

Miscellaneous

Maintenance Rule Database, Unit 1 Emergency Feedwater Initiation  
Maintenance Rule Database, Unit 2 Emergency Feedwater  
System Performance Indicator, Emergency Feedwater Initiation & Control - Arkansas Unit 1  
System Performance Indicator, Emergency Feedwater - Arkansas Unit 2

Work Orders

00080580 01                      00080580 02

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

CRs

ANO-C-2006-0409                      ANO-1-2006-0202  
ANO-1-2006-0198

Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
COPD-024	Risk Assessment Guidelines	17
COPD-027	Emergent Issue Checklist	3
1107.003	Inverter and 120 V Vital AC Distribution	12

Section 1R15: Operability Evaluations

CRs

ANO-1-2002-1547	ANO-1-2004-0809	ANO-1-2006-0187
ANO-1-2003-0337	ANO-1-2005-2821	ANO-2-2006-0018
ANO-1-2003-0346	ANO-1-2005-2951	ANO-2-2006-0175
ANO-1-2004-0349	ANO-1-2005-3001	
ANO-1-2004-0428	ANO-1-2006-0004	

Documents

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
CEP-IST-1	IST Bases Document	3

Section 1R19: Postmaintenance Testing

CRs

ANO-1-2005-3001	ANO-1-2006-0313
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Procedure

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
1304.063	Unit 1 P-7A Speed Control Calibration	13

Work Orders

00048563 01	50983447 01	51023401 01
00083219 01	51011794 01	

Section 1R22: Surveillance Testing

Procedures

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>	<u>DATED</u>
1103.013	RCS Leak Detection," Supplement 1	21	March 14, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 15, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 16, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 17, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 18, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 19, 2006
1103.013	RCS Leak Detection," Supplement 1	21	March 20, 2006

## LIST OF ACRONYMS

ANO	Arkansas Nuclear One
CAP	corrective action program
CFR	Code of Federal Regulations
CR	condition report
EFW	emergency feedwater
ESF	engineered safety feature
ICS	integrated control system
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
SSC	structure, system, and component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis