



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

January 28, 2002

Craig G. Anderson, Vice President,
Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, Arkansas 72801-0967

**SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - NRC INTEGRATED INSPECTION
REPORT 50-313/01-08, 50-368/01-08**

Dear Mr. Anderson:

On September 30 through December 29, 2001, the NRC completed several baseline inspections at the Arkansas Nuclear One, Units 1 and 2, facility. The enclosed report presents the results of those inspections, which were discussed on October 4, October 12, and October 16, 2001; and January 9, 2002; with you and other members of your staff.

This report documents a routine resident inspection; an examination of your heat sink performance program; an evaluation of an emergency plan change; and, an examination of your program to maintain occupational radiation exposure as low as reasonably achievable (ALARA). Within these areas, the inspections consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The inspection identified one finding that was evaluated by the significance determination process and determined to have very low safety significance (Green).

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories and, although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design-basis threat. From these audits, the NRC has concluded that your security program is adequate at this time.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response 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).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Linda Joy Smith, Chief
Project Branch D
Division of Reactor Projects

Dockets: 50-313
50-368
Licenses: DPR-5
NPF-6

Enclosure:
NRC Inspection Report
50-313/01-08; 50-368/01-08

cc w/enclosure:
Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P.O. Box 31995
Jackson, Mississippi 39286-1995

Vice President
Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, Mississippi 39286-1995

Manager, Washington Nuclear Operations
ABB Combustion Engineering Nuclear
Power
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

County Judge of Pope County
Pope County Courthouse
100 West Main Street
Russellville, Arkansas 72801

Entergy Operations, Inc.

-3-

Winston & Strawn
1400 L Street, N.W.
Washington, DC 20005-3502

Bernard Bevill
Radiation Control Team Leader
Division of Radiation Control and
Emergency Management
Arkansas Department of Health
4815 West Markham Street, Mail Slot 30
Little Rock, Arkansas 72205-3867

Mike Schoppman
Framatome ANP, Inc.
Suite 705
1911 North Fort Myer Drive
Rossylin, Virginia 22209

Electronic distribution from ADAMS by RIV:

Regional Administrator (**EWM**)

DRP Director (**KEB**)

DRS Director (**ATH**)

Senior Resident Inspector (**RLB3**)

Branch Chief, DRP/D (**LJS**)

Project Engineer, DRP/D (**RVA**)

Staff Chief, DRP/TSS (**PHH**)

RITS Coordinator (**NBH**)

NR Event Tracking System (**IPAS**)

Scott Morris (**SAM1**)

ANO Site Secretary (**VLH**)

Dale Thatcher (**DFT**)

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos: 50-313, 50-368
License Nos: DPR-51, NPF-6
Report No: 50-313/01-08, 50-368/01-08
Licensee: Entergy Operations, Inc.
Facility: Arkansas Nuclear One, Units 1 and 2
Location: Junction of Hwy. 64W and Hwy. 333 South
Russellville, Arkansas
Dates: September 30 through December 29, 2001
Inspectors: R. Bywater, P.E., Senior Resident Inspector
R. Azua, Senior Project Engineer
C. Clark, Reactor Inspector, Engineering and Maintenance Branch
P. Elkmann, Emergency Preparedness Inspector, Plant Support Branch
J. Melfi, Project Engineer
M. Shannon, Senior Health Physicist, Plant Support Branch
K. Weaver, Resident Inspector

Approved By: Linda Joy Smith, Chief
Project Branch D
Division of Reactor Projects

Attachment: Supplemental Informtion

SUMMARY OF FINDINGS

Arkansas Nuclear One, Units 1 and 2
NRC Inspection Report 50-313/01-08; 50-368/01-08

IR 05000313/2001-08, IR 05000368/2001-08; Entergy Operations, Inc.; Arkansas Nuclear One, Units 1 & 2; on 09/30-12/29/2001. Fire Protection. One Green finding.

The report covered a 12-week period of resident inspection, announced inspections by a regional senior health physics inspector, a regional engineering inspector, and in-office reviews by an emergency preparedness inspector and project engineer. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609 "Significance Determination Process." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/reactors/operating/oversight/power-reactor.html>.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

Green. A finding of very low safety significance was identified because, during a fire brigade drill in the Unit 1 south Bus A3 switchgear room, fire brigade members selected a hose to extend from a hose reel that was not identified in the prefire plan as the primary or secondary hose reel. The selected hose was too short to reach the fire scene. Additionally, use of the secondary hose reel would have resulted in breaching a fire barrier between redundant trains of safe shutdown equipment.

The finding was greater than minor because retrieval of additional hose would have resulted in a delay in application of water suppression in an actual fire. The finding is of very low safety significance because there were no degraded fire barriers, the fire drill scenario did not require the use of water to extinguish the fire, and because this finding only affects the mitigating systems cornerstone (Section 1R05.2).

B. Licensee Identified Violations

None.

Report Details

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On October 24, 2001, Unit 1 operators reduced reactor power to approximately 25 percent in preparation for adding lube oil to Reactor Coolant Pump D and to perform maintenance on the main turbine auxiliary speed sensor probe. Following the maintenance activities, the operators returned Unit 1 to 100 percent power on October 25.

Unit 1 remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On November 1, 2001, Unit 2 was reduced to approximately 20 percent power following a drop of Control Element Assembly 43 into the reactor core. During troubleshooting and maintenance activities for Control Element Assembly 43, Unit 2 experienced an automatic reactor trip from approximately 20 percent power. On November 2, following posttrip review and recovery activities, Unit 2 operators commenced a reactor startup and made the reactor critical. The operators subsequently commenced a power escalation and returned Unit 2 to 100 percent power on November 4. Unit 2 remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

1R01 Adverse Weather Protection (711111.01)

a. Inspection Scope

On November 8, 2001, because of the upcoming winter months when there is a high probability that ambient temperatures would go below freezing conditions, the inspectors reviewed both Units 1 and 2 preparations for freeze protection of plant equipment. These freeze protection preparations and actions are documented in Unit 1 Procedure 1104.039, "Plant Heating and Cold Weather Operations," Revision 14, and Unit 2 Procedure 2106.032, "Unit Two Freeze Protection Guide," Revision 6. In addition, the inspectors walked down the Unit 1 borated water storage tank area on November 30, and both the Units 1 and 2 intake structures on December 4-14 to verify that the freeze protection measures were performed and in place in order to protect safety-related equipment from being affected by adverse freezing weather conditions. The inspectors also walked down other plant locations with minimum temperature limitations, including the Unit 2 battery rooms. The batteries have a Technical Specification requirement to be maintained greater than 60°F. The inspectors reviewed whether provisions for maintaining adequate room temperature was acceptable. The inspectors reviewed Procedure 1000.028, "Control of Temporary Alterations," Revision 23, and Condition Report ANO-C-2001-0624 to evaluate the acceptability of the licensee's actions.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Between October 11-28, 2001, the inspectors performed a complete walkdown of the accessible portions of the Unit 1 reactor building spray system Train B. The majority of this walkdown was performed when the Unit 1 reactor building spray system Train A was taken out of service for maintenance. During the walkdown, the inspectors verified correct valve alignment, electric power availability, and no adverse material conditions of system components. Positions of valves and electrical power breakers were compared to Procedure 1104.005, "Reactor Building Spray System Operation," Revision 41. In addition, the components walked down in the field were verified against Piping and Instrument Diagram M232, Sheet 1, "Decay Heat Removal System," Revision 95, and Piping and Instrument Diagram M-236, Sheet 1, "Reactor Building Spray and Core Flooding Systems," Revision 87.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Tours (71111.05Q)

a. Inspection Scope

The inspectors reviewed the Fire Hazards Analysis Report, Revision 7, dated October 8, 2001, to determine the required fire protection design features and fire area boundaries of the following areas:

- Unit 2 Battery 2D11 room
- Unit 2 Battery 2D12 room
- Unit 2 control room
- Unit 1 intake structure
- Unit 1 north switchgear room
- Unit 1 south switchgear room

Between November 2-9, November 27-29, and on December 21, 2001, the inspectors walked down these areas to assess the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures.

b. Findings

No findings of significance were identified.

.2 Annual Drill Observation (71111.05A)

a. Inspection Scope

On December 21, 2001, the inspectors observed an announced fire brigade drill (Drill FBDRL-2001-21, Fire Zone 100-N) from both the control room and the fire zone to evaluate the readiness of the licensee's fire brigade to fight fires. The inspectors used the fire protection plan referenced in Unit 1 License Condition 2.c(8) and the Safety Analysis Report to evaluate the demonstrated conditions. The inspectors reviewed the strategies and information in Prefire Plan 1A-372-100-N.doc, "South Switchgear Room," Revision 1, to verify if it was consistent with the fire protection design features, fire area boundaries, and combustible loading assumptions shown in the fire protection plan. The inspectors observed the fire brigade members: (1) donning protective clothing, self-contained breathing apparatus, (2) selecting turnout gear, (3) entering the fire zone, (4) using the prefire plan strategies, and (5) communicating with the control room staff. The inspectors observed the fire fighting equipment brought to the fire scene to evaluate whether sufficient equipment was available for the simulated fire. The inspectors evaluated whether the fire hose lines identified in the prefire plan were capable of reaching the fire hazard and whether using the hose was adequately simulated (i.e., laid out without flow constrictions). The inspectors observed fire fighting directions and radio communications between the brigade leader, brigade members, and the control room. The inspectors observed the postdrill critique to evaluate if the drill objectives and acceptance criteria were satisfied in accordance with Arkansas Nuclear One Training Desk Guide 6.5, Attachment 4, "Fire Brigade Drill Performance Evaluation," Revision 4.

b. Findings

The simulated fire involved a faulted 4 kV breaker in the south switchgear room which contains Bus A3. Fire brigade and control room personnel promptly recognized the importance of maintaining train separation between the affected room and the adjoining north switchgear room, which contains Bus A4, by prohibiting access to the fire from the unaffected room. Suppression of the fire was achieved by use of fire extinguishers after the control room deenergized Bus A3. Water suppression was not required for this fire, however, fire brigade members extended a hoseline to provide water suppression from the south entrance of the Bus A3 switchgear room. The inspectors observed that brigade members extended a hoseline from a hose reel station that was neither the primary nor the secondary hose reel identified in the prefire plan. The hose that was extended was found to be short and would not have been capable of entering the Bus A3 switchgear room. The brigade leader ordered that an additional hose be obtained from the fire equipment storage location so the chosen hose could be extended into the room if required. The inspectors noted that although the brigade members read the prefire plan, they failed to determine which hose reels were designated as primary or secondary for a fire in this location. Rather, brigade members chose a hose reel that was visible to them.

The inspectors also noted that had the secondary hose reel been used, it would have required extending the hose through the Bus A4 switchgear room, which would have breached the fire barrier between two redundant trains of equipment. The control room

operators agreed that this would not have been an acceptable access route and that had the fire brigade been aware of the secondary hose reel, they would not have chosen to use it for the same reason.

Although water suppression was not required for this fire, the inspectors concluded that the choice of hose reel actually selected, rather than the primary hose reel identified in the prefire plan, had the potential to delay water suppression capability in the Bus A3 switchgear room if it had been actually required. Additionally, selection of the secondary hose reel may not be appropriate in the prefire plan since it results in breaching the 3-hour rated fire door barrier between the switchgear rooms. Finally, the inspectors noted that the location of the hose reel information, in the prefire plan, would make it difficult for fire brigade leaders to preselect hose reels during an actual fire emergency. This finding was more than minor because of the potential to degrade manual suppression, a fire protection feature. The licensee initiated Condition Report ANO-1-2002-0049 in response to this finding.

Because the effectiveness of the fire brigade, to extinguish the fire, during the drill, was not affected and no fire barriers separating redundant trains of safe shutdown equipment were degraded and the finding only affects the mitigating systems cornerstone, the finding is of very low safety significance. Based on these factors, the finding is characterized by the Significance Determination Process as having very low risk significance (Green).

1R07 Heat Sink Performance (71111.07B)

Introduction

The purpose of this biennial review was to verify: (1) that any potential heat exchanger deficiencies, which could mask degraded performance, were identified; (2) that any potential common cause heat sink performance problems that had the potential to increase risk at the facility were identified; and, (3) that the licensee had adequately identified and resolved heat sink performance problems that could result in initiating events or affect multiple heat exchangers in mitigating systems and, thereby, increase risk. The plant risk assessment was used to select three heat exchangers, installed in the service water loops, for review. The heat exchangers selected are listed below:

- Unit 1 Reactor Building Service Water Cooling Coils VCC-2A, -2B, -2C, and -2D
- Unit 1 Primary Makeup Pump Room Coolers VUC-7A, -7B, and -7C
- Unit 2 High Pressure Safety Injection (HPSI) Pump Room Coolers 2VUC-11A and -11B

.1 Performance of Testing, Maintenance, and Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's inspection, maintenance, and test methodology for the selected heat exchangers to verify that it was adequate to ensure proper heat transfer.

The inspectors also reviewed the heat exchanger inspection and test results. Specifically, the inspectors verified proper extrapolation of test conditions to design conditions, appropriate test instrumentation used, and appropriate accounting for instrument inaccuracies. Additionally, the inspectors verified that the licensee appropriately trended these inspection and test results, assessed the causes of the trends, and took necessary actions for any step changes in these trends.

The inspectors also verified that chemical treatments and methods used to control biotic fouling for the service water system was sufficient to ensure effective heat exchanger and heat sink performance.

b. Findings

No findings of significance were identified.

.2 Verification of Conditions and Operations Consistent with Design Bases

a. Inspection Scope

For the selected heat exchangers, the inspectors verified that the licensee-established heat sink and heat-exchanger condition, operation, and test criteria was consistent with the design assumptions. Specifically, the inspectors reviewed the applicable test calculations to ensure that the thermal performance test acceptance criteria for the selected heat exchangers were being applied consistently throughout the calculations. The inspectors also verified that the appropriate acceptance values for fouling and tube plugging for the heat exchangers, remained consistent with the values used in the design-basis calculations. Finally, the inspectors verified that the parameters measured during the thermal performance and flow balance tests for the selected systems were consistent with those assumed in the design bases.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors examined the corrective action program for significant problems with the selected components over the past 2 years. The inspectors selected a sample of

18 condition reports for review, which are identified in the attachment to this report.

The inspectors used Inspection Procedure 71152, "Identification and Resolution of Problems," as additional guidance for reviewing these condition report issues and, subsequently, verified that the licensee took appropriate actions to prevent recurrence of the identified problems.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On December 11, 2001, the inspectors observed two licensed operator simulator requalification evaluation scenarios. The inspectors observed Unit 1 Simulator Evaluation ES-1-012 and Unit 2 Simulator Evaluation ES-2-005. Both scenarios involved a station blackout event. The inspectors compared their observations to the applicable abnormal and emergency operating procedures, the emergency plan procedures, and applicable Technical Specifications. In addition, the inspectors also attended the critique following each of the scenarios held by the Units 1 and 2 operations training organizations so that they could identify discrepancies and deficiencies in training and to assess the performance of the licensed operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

During the inspection period, the inspectors reviewed licensee implementation of the Maintenance Rule. The inspectors verified structure and component scoping, characterization, safety significance, performance criteria, and the appropriateness of goals and corrective actions. The inspectors compared the licensee's implementation of the Maintenance Rule to the requirements outlined in 10 CFR 50.65 and Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2. The inspectors reviewed the following components:

- Main steam safety valves
- Emergency Feedwater (EFW) Pump P-7A
- HPSI Hot Leg Injection Check Valve 2SI-26A
- Intake Structure Ventilation System Fans 2VEF-25A/B
- 125 VDC Vital Bus D01
- Chemical and volume control system

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors evaluated and discussed with the licensee the risk assessments listed below to verify that assessments were performed when required and appropriate compensatory actions were taken. The inspectors reviewed these assessed risk configurations against actual plant conditions and any in-progress evolutions or external events to verify that the assessments were accurate, complete, and appropriate for the condition. In addition, the inspectors walked down the control room and plant areas to verify that compensatory measures identified by these risk assessments were appropriately performed. The specific plant configurations included:

- | | |
|--------------------------------------|---|
| October 15, 2001 | Unit 2 main feedwater line leak on vent stack of Valves 2FW-2000A and 2FW-2000B where it connects to the 24-inch feedwater line to Steam Generator A |
| September 30, 2001 | Unit 1 main turbine auxiliary speed channel failure |
| December 4, 2001 | Unit 1 EFW Pump P-7B scheduled system outage |
| October 24, 2001 | Unit 1 reactor coolant pump oil addition |
| October 30 through November 7, 2001 | Control room tracer gas test |
| November 1, 2001 | Unit 2 control element assembly drop, followed by emergency boration, control element assembly power switch replacement and testing, and Unit 2 reactor trip. Documentation reviewed included Condition Reports ANO-2-2001-1115 and ANO-2-2001-1137 |
| November 28, 2001 | Unit 2 control element assembly calculator maintenance. Documentation reviewed included Condition Report ANO-2-2001-1238 |
| November 30 through December 5, 2001 | Alternate AC diesel generator preventive maintenance and testing. Documentation reviewed included Condition Reports ANO-C-2001-0678 and ANO-C-2001-0679 |
| December 6, 2001 | Unit 1 high pressure injection system valve maintenance and flow transmitter maintenance. Documentation reviewed included Condition Report ANO-1-2001-1269 |

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Evolutions (71111.14/71153)

a. Inspection Scope

For the nonroutine events described below, the inspectors reviewed operator logs, plant computer data, post-transient review reports, and interviewed licensed operators to determine what occurred and how the operators responded. Also, the inspectors determined if the response was in accordance with plant procedures and Technical Specifications.

On October 24, 2001, the inspectors observed the licensee's Unit 1 power reduction to 25 percent power for installation of Temporary Alteration Package 992196E102 to provide for a remote oil addition system for the Reactor Coolant Pump D motor upper bearing oil reservoir.

On November 1, 2001, the inspectors observed plant personnel response following the drop of a Unit 2 control element assembly, emergency boration, and subsequent automatic reactor trip. Documentation reviewed included Condition Reports ANO-2-2001-1115 and ANO-2-2001-1137.

On November 15, 2001, the inspectors reviewed operator performance following the failure of the Unit 2 Channel C nuclear instrumentation power supply. Documentation reviewed included Condition Report ANO-2-2001-1183.

On December 12, 2001, the inspectors observed Unit 1 operators respond to an instrument air dryer failure. Documentation reviewed included Condition Report ANO-1-2001-1305.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability determinations to assess the correctness of the evaluations, the use and control of compensatory measures if needed, and compliance with the Technical Specifications. The inspectors' review included a verification that the operability determinations were made as specified by the licensee's Procedure LI-102, "Corrective Action Process," Revision 1, and Procedure 1000.104, "Condition Reporting and Immediate Reportability Determinations," Revision 17. The technical adequacy of the determinations were reviewed and compared to the Technical Specifications, Technical Requirements Manual, Updated Final Safety Analysis Report (UFSAR),

associated design-basis documents, and licensing submittals. The operability determinations that were reviewed were documented in the following condition reports:

ANO-C-2001-0607
ANO-C-2001-0613
ANO-C-2001-0617
ANO-C-2001-0625

All of the above condition reports involved results obtained from control room boundary in leakage tracer gas testing. Test results were acceptable for concluding the control room envelope was operable.

b. Findings

No findings of significance were identified

1R16 Operator Workarounds (71111.16)

.1 Review of the Cumulative Effects of Operator Workarounds

a. Inspection Scope

The inspectors interviewed operators and reviewed the Unit 1 and Common control room deficiency and operator workaround lists to determine the number of operator workarounds that existed and to assess the cumulative effect of the workarounds.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

For the maintenance identified below, the inspectors observed the postmaintenance testing in the control room or locally and reviewed the test data obtained from the field. The inspectors observed whether the tests were performed in accordance with the procedures, that the procedures' acceptance criteria were addressed in the Technical Specifications, and that the results recorded met the test acceptance criteria. These maintenance items included:

- Unit 1 Reactor Building Spray Pump P-35A testing in accordance with Procedure 1104.005, "Reactor Building Spray System Operation," Revision 40, conducted on October 11, 2001, following a scheduled system outage
- Unit 2 Turbine Driven EFW Pump 2P-7A testing in accordance with Procedure 2106.006, "Emergency Feedwater System Operations," Supplement 10, "2P-7A Start Test," Revision 53, conducted on

October 22, 2001, following scheduled system maintenance

- Unit 1 Reactor Coolant Pump P-32D motor remote lube oil fill system testing in accordance with Temporary Alteration Package 01-1-005, conducted on October 24, 2001, following installation
- Unit 1 High Pressure Injection Pump P-36B testing in accordance with Procedure 1104.002, "Makeup and Purification System," Supplement 4, "HPI Pump P-36B Test," Revision 55, conducted on November 16, 2001, following a scheduled system outage
- Unit 2 mid-cycle Main Steam Safety Valve 2PSV-1002 testing in accordance with Procedure 2306.006, "Unit 2 Main Steam Safety Valve Test," Revision 12, as part of Maintenance Action Item 50232, conducted on November 7, 2001
- Unit 1 Emergency Feed Water Pump P-7B testing in accordance with Procedure 1106.006, "Emergency Feedwater Pump Operation," Supplement 1, "Electric Emergency Feedwater Pump Monthly Test," Revision 62, conducted on December 4, 2001, following planned scheduled maintenance
- Unit 2 control element assembly testing following power switch replacement performed in accordance with Maintenance Action Item 45437 on November 1, 2001
- Unit 1 Decay Heat Vault Purge Ventilation System Dampers CV-7621, CV-7622, CV-7637, and CV-7638 leakage testing in accordance to action plan identified in Condition Report ANO-1-2001-0656, conducted on October 23 and 26, 2001
- Units 1 and 2 Alternate ac Diesel Generator Battery 2D-55 discharge test in accordance with Maintenance Action Item 40590, conducted on December 11, 2001, following battery cell replacement
- Unit 2 Low Pressure Safety Injection System Injection Valve 2CV-5077-2 testing in accordance with Procedure 2104.040, "LPSI System Operations," Supplement 3, "Quarterly LPSI & RWT Stroke Test with SDC Secured," Revision 33, conducted on December 11, 2001, following planned scheduled maintenance

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed from either the control room or locally the performance of, and/or reviewed the documentation for, the following surveillance tests. This was done

to verify that the surveillance tests were performed in accordance with approved licensee procedures and met Technical Specification requirements. In addition, the applicable test data was also reviewed to verify whether they met Technical Specifications, UFSAR, and licensee procedure requirements.

- Procedure 1104.005, "Reactor Building Spray System Operation," Supplement 3, "RB Spray Pump P-35A Quarterly Test," Revision 41, conducted on October 11, 2001 (Unit 1)
- Procedure 2106.006, "Emergency Feedwater System Operations," Supplement 10, "2P-7A Start Test," Revision 53, conducted on October 22, 2001 (Unit 2)
- Procedure 2104.036, "Emergency Diesel Generator Operations," Supplement 1C, "2DG1 Semi-Annual Test (Fast Start)," Revision 45, conducted on October 10, 2001 (Unit 2)
- Procedure 1104.036, "Emergency Diesel Generator Operation," Supplement 2, "DG2 Monthly Test," Revision 40, conducted on October 22, 2001 (Unit 1)
- Procedure 1106.006, "Emergency Feedwater Pump Operation," Supplement 1, "Electric Emergency Feedwater Pump Monthly Test," Revision 62, conducted on December 4, 2001 (Unit 1)
- Work Plan 1409.731, "Control Room Tracer Gas Test," Revision 1, conducted on October 30 through November 7, 2001 (Units 1 and 2)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the implementation of the listed modifications to confirm modifications were installed as authorized per Procedure 1000.103, "Plant Modification Process," Revision 7, and Procedure 1000.028, "Control of Temporary Alterations," Revision 23.

- Temporary Alteration Package 01-1-005, Unit 1 Reactor Coolant Pump P-32D motor remote lube oil fill system
- Engineering Request ER010840R201, Unit 2 Main Feedwater Line Vent Valve 2FW-2000A/B leak repair
- Engineering Request ER003305E201, Unit 2 Chemical and Volume Control System Valve 2CVC-1186 leak repair

b. Findings

No findings of significance were identified.

Emergency Preparedness (EP)

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an in-office review of Change 036-03-0 to the Arkansas Nuclear One Emergency Plan Implementing Procedure 1903.010, "Emergency Action Level Classification," received October 9, 2001, against 10 CFR 50.54(q) to determine if the revision decreased the effectiveness of the plan.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed portions of the announced emergency preparedness drill conducted on November 14, 2001, to evaluate emergency response organization performance and adequacy of licensee's critique process. The drill was conducted using the Unit 2 simulator and all onsite response facilities (emergency operations facility, technical support center, and the operations support center) were activated.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspectors interviewed radiation workers and radiation protection personnel through the controlled access area and conducted independent radiation surveys of selected work areas. The following items were reviewed and compared with regulatory requirements to assess the licensee's program to maintain occupational exposure ALARA:

- ALARA program procedures
- Processes used to estimate and track exposures
- Plant collective exposure history for the past 3 years, current exposure trends, and 3-year rolling average dose information
- Two radiation work permit packages for work activities which resulted in some of the highest personnel collective exposures during Unit 1 Refueling Outage 16 (Radiation Work Permit 2001-1048, "Remove/Replace Scaffolding and Insulation," and Radiation Work Permit 2001-1206, "Control Rod Drive Mechanism Nozzle Repair Work")
- Use of engineering controls to achieve dose reductions
- Hot spot tracking and reduction program
- Radiological work planning
- A summary of ALARA and radiological worker performance related corrective action reports written since May 1, 2001 (four corrective action reports were reviewed in detail: Condition Reports ANO-C-2001-0297, ANO-2-2001-0420, ANO-C-2001-0437, and ANO-2-2001-0926)
- Declared pregnant worker dose monitoring controls
- ALARA program portion of Quality Assurance Audit QA-14-2001-ANO-1 and Quality Assurance Surveillances QS-2001-ANO-016 and QS-2001-ANO-064

No work was performed in high exposure or high radiation areas during this inspection. Therefore, this aspect of the above procedure could not be evaluated.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

On October 22-26, November 5-9, and December 3-7, 2001, the inspectors reviewed Units 1 and 2 operations station logs, monthly operating reports, and condition reports for the third quarter of 2001 to verify the accuracy and completeness of data used to calculate and report the following performance indicators in accordance with Procedure LI-107, "NRC Performance Indicator Process," Revision 0.

- Unit 1 scrams without heat removal (third quarter 2001)
- Unit 2 scrams without heat removal (third quarter 2001)
- Unit 1 HPSI unavailability (third quarter 2001)
- Unit 2 HPSI unavailability (third quarter 2001)
- Unit 1 EFW unavailability (third quarter 2001)
- Unit 2 EFW unavailability (third quarter 2001)
- Unit 1 residual heat removal unavailability (third quarter 2001)
- Unit 2 residual heat removal unavailability (third quarter 2001)
- Unit 1 reactor coolant system (RCS) activity (third quarter 2001)
- Unit 2 RCS activity (third quarter 2001)
- Unit 1 RCS leakage (third quarter 2001)
- Unit 2 RCS leakage (third quarter 2001)

b. Findings

No findings of significance were identified.

40A3 Event Followup (71153, 71111.14)

(Closed) Licensee Event Report 50-313/2001-002: Reactor Coolant System Pressure Boundary Leakage due to a Crack in a Control Rod Drive Mechanism Nozzle Reactor Vessel Head Penetration.

The reported condition involved leakage on one control rod drive mechanism nozzle. The leak was determined to have resulted from a crack (predominately due to primary water stress corrosion cracking) which initiated in the weld material. The licensee captured this issue in their corrective action program. Repairs to the reactor vessel head penetration were completed prior to restart from the outage. The potential safety consequence of circumferential cracking is currently being evaluated by the NRC as a generic problem. The licensee committed in their response (dated September 4, 2001) to NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," to perform qualified visual examinations of their reactor vessel head nozzles in the next refueling outage, currently scheduled for the fall of 2002.

The inspectors reviewed the LER, the leakage monitoring methodology in effect during operation prior to the outage, and operator logs to determine whether the licensee's leak detection practices were adequate and whether the operators would have been expected to identify the small amount of leakage during plant operation. The inspectors also used this information to evaluate the licensee's compliance with Technical Specification 3.1.6.3.a requirements. No findings of significance were identified. The licensee included this deficiency in their corrective action program as Condition Reports ANO-1-2001-0198 and ANO-1-2001-0295. This LER is closed.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the heat sink performance inspection results to Mr. R. Bement, General Manager, and other members of licensee management on October 4, 2001. Licensee management acknowledged the inspection findings.

The inspectors presented the inspection results of the ALARA planning and controls inspection to Mr. C. Anderson, Vice President, and other members of licensee management at the conclusion of the inspection on October 12, 2001. The licensee acknowledged the findings presented.

The inspectors presented the inspection results of the emergency plan change inspection to Mr. R. Fuller, Manager, Emergency Preparedness, and other members of licensee management during a telephonic exit meeting on October 16, 2001. The licensee acknowledged the findings presented.

The resident inspectors presented the inspection results to Mr. C. Anderson, Vice President, and other members of the licensee's management staff on January 9, 2002. The licensee acknowledged the findings presented.

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

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Anderson, Vice President, Arkansas Nuclear One
G. Ashley, Manager, Licensing
B. Bement, General Manager, Arkansas Nuclear One
E. Blackard, Design Engineer
E. Christian, Superintendent, Instrumentation and Control
M. Cooper, Licensing Specialist
S. Cotton, Director, Nuclear Safety Assurance
N. Eggemeyer, Manager, Technical Support
C. Eubanks, Manager, Maintenance
R. Fuller, Manager, Emergency Preparedness
B. Gordon, Manager, Unit 2 Outage
J. Hoffpauir, Plant Manager, Operations
R. Howerton, Technical Assistant to General Manager/Vice President
K. Jeffery, Supervisor, Security Operations
J. Kowalewski, Director, Engineering
M. Little, Unit 1 Operations
T. Mitchell, Manager, Unit 2 Operations
T. Nickels, Superintendent, Radiation Protection
R. Nielson, Manager, Planning, Scheduling, and Outage
S. Pyle, Licensing Specialist
J. Sigle, Unit 2 Operations
D. Stoltz, Supervisor, Radiation Protection
C. Tyrone, Manager, Quality Assurance
F. Van Buskirk, Nuclear Safety and Licensing Specialist
W. Walker, Engineering Programs and Components

ITEMS OPENED AND CLOSED

Closed

50-313/2001-002 LER Reactor Coolant System Pressure Boundary Leakage due to a Crack in a Control Rod Drive Mechanism Nozzle Reactor Vessel Head Penetration (Section 4OA3)

DOCUMENTS REVIEWED

Procedures:

1000.104 Condition Reporting and Corrective Actions, Revision 15
1203.030 Lost of Service Water, Change 012-00-0
1309.013 Service Water Flow Test, Change 012-00-0
2311.002 Service Water System Flow Test, Change 012-00-0
1000.153 Engineering Request Process, Change 006-00-0
LI-102 Corrective Action Process, Revision 0

Miscellaneous Documents:

Engineering Request 002477N101 Replace Reactor Building Chilled Water Cooling Coil, Revision 0

Technical Manual A220.0010 Technical Manual for Unit 1 Reactor Building Cooling Units, Revision 5

Technical Manual A220.0100 Installation and Maintenance of the Unit 1 Reactor Building Cooling Units, Revision 1

Temp Mod. 95-1-025
ULD-1SYS-06

ANO-1 Reactor Building Heating and Ventilation and Reactor Building Purge Systems, Revision 2

ULD-1-SYS-30

ANO-1 Auxiliary Building HVA System, Revision 2

ULD-2-SYS-30

ANO Unit 2 Auxiliary Building HVAC System, Revision 6

Condition Reports:

ANO-C-1999-0209
ANO-C-1999-0213
ANO-1-1999-0253
ANO-1- 1999-0393
ANO-1- 1999-0404
ANO-1- 1999-0405

ANO-1- 1999-0406
ANO-1- 1999-0429
ANO-C-2000-0221
ANO-1-2000-0294
ANO-1-2000-0389
ANO-2-2000-0230

ANO-2-2000-0253
ANO-2-2000-0256
ANO-2-2000-0861
ANO-2-2000-1059
ANO-C-2001-0020
ANO-1-2001-0671

Calculations:

87-E-0011-03 High Pressure Injection Room Temperature Following a 1" LOCA for 72 Hour Mission Time with No Room Cooling, Revision 0

87-E-0011-04 Post LOCA HPI Room Temperature with No Room Cooling, Revision 1

87-E-0011-05 Makeup Rooms 54, 55, and 56 Cooling Capacity, Revision 0

87-E-0011-06 Post LOCA High Pressure Injection Room Temperature with No Room Cooling and Two Trains of Emergency Core Cooling Available, Revision 1

88-E-0098-16 Revised Containment Cooler Data for ANO-1, Revision 1

88-E-0098-20 ANO-1 Design Basis Accident Reanalysis, Revision 1

94-E-0095-19 Room 2010 Heat Load Evaluation, Revision 0

00-E-0012-05 Evaluation of Flashing within the Service Water Coils of the Containment Air Coolers, Revision 0

00-E-0024-02 Service Water 1R16 Performance Analysis Report, Revision 0

Engineering Reports:

91-R-2013-01 Service Water Performance Testing Methodology, Revision 07
91-R-2017-07 2R14 Service Water System and Flow Test Evaluation, Revision 0

Maintenance Action Items:

6325
19438
25498
27154
28113
31943
38045
48089