

**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket Nos.: 50-313; 50-368

License Nos.: DPR-51; NPF-6

Report No.: 50-313/99-17, 50-368/99-17

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

Location: 1448 S. R. 333  
Russellville, Arkansas 72801

Dates: November 14 through December 18, 1999

Inspectors: R. Bywater, Senior Resident Inspector  
K. Weaver, Resident Inspector

Approved by: P. Harrell, Chief, Project Branch D  
Division of Reactor Projects

Attachment: Supplemental Information

## EXECUTIVE SUMMARY

### Arkansas Nuclear One, Units 1 and 2 NRC Inspection Report 50-313/99-17; 50-368/99-17

This routine announced inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 5-week period of resident inspection.

#### Operations

- Unit 2 operators successfully performed the reactor startup following the completion of Midcycle Outage 2P99. The licensed operators demonstrated good reactivity management practices and communications with reactor engineering support personnel (Section O1.2).
- Housekeeping practices and component material condition were satisfactory in the Unit 1 Train A decay heat vault. The Train A low pressure injection system valve lineup was in accordance with the procedure. All components were properly identified and labeled as denoted on the piping and instrument drawing and the procedure (Section O2.1).

#### Maintenance

- A Notice of Enforcement Discretion from the requirements of Technical Specification 3.0.3 for Unit 1 was verbally granted by the NRC on December 15, 1999. The licensee identified that a defective tube in Once Through Steam Generator A had not been repaired during the previous refueling outage as required by Technical Specification 4.18.5.b. The NRC's decision to grant enforcement discretion was based on the conclusion that the tube was structurally capable of withstanding normal or accident conditions without failure or leakage that would result in exceeding accident analysis assumptions (Section M1.1).
- Unit 1 operators demonstrated good attention to detail during the reactor building Spray Pump B surveillance testing. The operators quickly identified that the reactor building Spray Pump B Lube Oil Cooler Service Water Inlet Valve CV-3805 had a dual opened and closed indication after stroking in the open direction. The Unit 1 operators appropriately retested the valve in accordance with the procedure and verified that the valve was functioning properly (Section M1.2).
- A violation of Unit 1 Technical Specification 3.15 was identified for having an inoperable fuel handling area ventilation system during movement of irradiated fuel in the spent fuel pool on September 28, 1999. The violation was caused by inappropriate work practices and a deficient work plan, which resulted in an unauthorized modification of the fuel handling area ventilation system. This Severity Level IV violation is being treated as a noncited violation in accordance with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 1-1999-0422 (Section M8.1).
- Unit 1 operators conduct of the main turbine throttle valve and governor valve testing was good. Maintenance, engineering, and operations personnel conducted effective

troubleshooting and replacement of a failed electro-hydraulic control servo positioning valve for Throttle Valve 1 (Section O1.3).

Plant Support

- Health physics technicians provided good oversight of personnel exiting the Unit 1 auxiliary building during a period when the noble gas concentration in the Unit 1 auxiliary building was higher than normal. Health physics technicians continuously monitored personnel to ensure that they properly cleared the radiation monitors before exiting the radiological controlled area (Section R1.1).

## Report Details

### Summary of Plant Status

At the beginning of this inspection period, Unit 1 was at 100 percent power. On December 10, 1999, Unit 1 operators reduced reactor power to approximately 85 percent for main turbine throttle valve and governor valve testing. On December 11, Unit 1 operators returned reactor power to 100 percent following the testing activities and replacement of the electro-hydraulic control system servo positioning valve for Throttle Valve 1. At the end of this inspection period, Unit 1 remained at 100 percent power.

At the beginning of this inspection period, Unit 2 remained shutdown for Midcycle Outage 2P99. On November 23, 1999, Unit 2 operators made the reactor critical and entered Mode 1 following completion of Midcycle Outage 2P99. On November 26, Unit 2 achieved 100 percent reactor power. At the end of this inspection period, Unit 2 remained at or near 100 percent power.

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 General Comments (71707)**

The inspectors observed various aspects of plant operations, including shift manning, to verify compliance with Technical Specifications (TS), plant procedures, and the Updated Safety Analysis Report. The inspectors also observed the effectiveness of communications, management oversight, proper system configuration and configuration control, housekeeping, and operator performance during routine plant operations and surveillance testing.

The conduct of operations was professional. Evolutions were generally well controlled and performed according to procedures. Shift turnover briefs were comprehensive. Housekeeping was generally good and discrepancies were promptly corrected. Safety systems were found properly aligned. Specific events and noteworthy observations are detailed below.

##### **O1.2 Unit 2 - Startup Activities Following Completion of Midcycle Outage 2P99**

###### **a. Inspection Scope (71707)**

On November 23, 1999, Unit 2 operators performed a reactor startup in accordance with Procedures 2102.016, "Reactor Startup," Revision 6, and 2102.004, "Power Operations," Revision 26. The inspectors observed the operators make the reactor critical.

###### **b. Observations and Findings**

The inspectors observed that Unit 2 operators successfully performed the reactor startup. Prior to commencing the startup, the control element assembly estimated

critical position was determined to be Group 6 at 100 inches. The allowable target band for control element assembly position at criticality was between Group P at 104.5 inches and Group 6 at 150 inches. The reactor actually went critical with Group P at 125 inches (Group 6 remained fully inserted). Although criticality was achieved within the acceptable target band, the inspectors noted that Procedure 2102.016 had been written with the assumption that Group P would be fully withdrawn (150 inches) prior to the reactor going critical on Group 6. The licensee initiated a procedure improvement form to correct this discrepancy. The inspectors noted good reactivity management practices by the licensed operators and communications with reactor engineering support personnel during the approach to criticality.

c. Conclusions

Unit 2 operators successfully performed the reactor startup following completion of Midcycle Outage 2P99. The licensed operators demonstrated good reactivity management practices and communications with reactor engineering support personnel.

O1.3 Unit 1 - Main Turbine Governor Valve Testing

a. Inspection Scope (71707)

On December 10, 1999, Unit 1 operators reduced power to approximately 85 percent to perform main turbine throttle valve and governor valve testing in accordance with Procedure 1106.009, "Turbine Startup (Warmup and Roll)," Revision 28. The inspectors observed the power reduction, valve testing, and emergent maintenance activities associated with Throttle Valve 1.

b. Observations and Findings

The inspectors observed Unit 1 operators perform successful stroke tests of all four main turbine governor valves and three out of four throttle valves. Throttle Valve 1 failed to stroke upon demand. The inspectors observed troubleshooting activities performed by maintenance and engineering personnel, who determined that the electro-hydraulic control system servo positioning valve associated with Throttle Valve 1 required replacement. This failure did not prevent the throttle valve from automatically closing, if required. The inspectors observed licensee personnel replace the servo positioning valve in accordance with Maintenance Action Item 10570 and successfully complete the postmaintenance testing of Throttle Valve 1.

c. Conclusions

Unit 1 operators conduct of the main turbine throttle valve and governor valve testing was good. Maintenance, engineering, and operations personnel conducted effective troubleshooting and replacement of a failed electro-hydraulic control servo positioning valve for Throttle Valve 1.

## **O2 Operational Status of Facilities and Equipment**

### **O2.1 Unit 1 - Walkdown of Train A Low Pressure Injection (LPI) System**

#### **a. Inspection Scope (71707)**

The inspectors performed a walkdown of accessible portions of the Unit 1 Train A LPI system to verify proper system alignment and assess its material condition.

#### **b. Observations and Findings**

The inspectors reviewed Procedure 1104.004, "Decay Heat Removal Operating Procedure," Revision 66, and Piping and Instrument Drawing (P&ID) M-232, "Decay Heat Removal System," Revision 89. The inspectors verified that the valve lineup listed in Procedure 1104.004 matched the configuration represented on P&ID M-232 for the Train A LPI system. The inspectors walked down the Train A LPI system using Procedure 1104.004 and P&ID M-232. The inspectors noted that the valve lineup was in accordance with Procedure 1104.004 and P&ID M-232 and that specified valves were properly locked in the appropriate position. The inspectors noted that components in the field were properly labeled, identified, and accurately denoted on P&ID M-232.

The inspectors noted that good housekeeping practices were being maintained in the Train A decay heat vault and items were properly stored away from safety-related equipment. The material condition of the Train A LPI system was satisfactory.

#### **c. Conclusions**

Housekeeping practices and component material condition were satisfactory in the Unit 1 Train A decay heat vault. The LPI system valve lineup was in accordance with the procedure. All components were properly identified and labeled as denoted on the P&ID and in the procedure.

## **II. Maintenance**

### **M1 Conduct of Maintenance**

#### **M1.1 Unit 1 - Notice of Enforcement Discretion (NOED) for Defective Tube Identified in Once Through Steam Generator (OTSG) A (71707)**

On December 15, 1999, the licensee requested and was verbally granted an NOED from the requirements of Technical Specification (TS) 3.0.3. The reason for this request was that during a review of eddy current test data obtained during the last refueling outage, the licensee determined that a defective tube in the OTSG A had not been repaired as required by TS 4.18.5.b. This defective tube could not be repaired with the unit operating. The licensee declared OTSG A inoperable and entered into TS 3.0.3. The licensee's formal written request for discretion was documented in a letter (1CAN129905) to the NRC dated December 16, 1999. The NRC granted the NOED

based on the conclusion that the tube was structurally capable of withstanding normal or accident conditions without failure or leakage that would result in exceeding accident analysis assumptions. The licensee's failure to repair the defective tube during the last refueling outage is an unresolved item and will be the subject of a future NRC inspection (URI 50-313/9917-01).

**M1.2 Unit 1 - Reactor Building (RB) Spray Pump B Surveillance Testing**

a. Inspection Scope (61726)

On December 9, 1999, the inspectors observed Unit 1 operators perform surveillance testing of RB Spray Pump B. This test was required by TS 3.3.5 to be performed prior to removing RB Spray Pump A from service for planned maintenance.

b. Observations and Findings

The test was performed in accordance with Procedure 1104.005, "Reactor Building Spray System Operation," Revision 39. During performance of the test, the Unit 1 operators noted that the RB Spray Pump B Lube Oil Cooler Service Water Inlet Valve CV-3805 had a dual opened and closed indication after the valve was stroked in the open direction. The Unit 1 operators verified locally that the valve was actually open and initiated Condition Report 1-1999-0567 to document the dual control board position indication. The problem was determined to be with the control board indication and not with the valve, and a maintenance action item was initiated to investigate the problem. The inspectors noted that after the test was performed and RB Spray Pump B was secured, Unit 1 operators satisfactorily retested Valve CV-3805 in accordance with Section 12 of Procedure 1104.005. A dual control board indication was not received during this test.

c. Conclusions

Unit 1 operators demonstrated good attention to detail during the RB Spray Pump B surveillance testing. The operators quickly identified that the RB Spray Pump B Lube Oil Cooler Service Water Inlet Valve CV-3805 had a dual opened and closed indication after stroking in the open direction. The Unit 1 operators appropriately retested the valve in accordance with the procedure and verified that the valve was functioning properly.

**M1.3 Unit 1 - Emergency Feedwater Pump P7B Surveillance Testing**

The inspectors observed the Emergency Feedwater Pump P7B surveillance testing performed on December 7 in accordance with Procedure 1106.006, "Emergency Feedwater Pump Operation," Revision 59. The inspectors noted that the Unit 1 operators were knowledgeable of the procedure instruction and equipment performance. All equipment functioned as required and EFW Pump P7B successfully passed the surveillance test.

**M8 Miscellaneous Maintenance Issues (92700)**

**M8.1 (Closed) Licensee Event Report (LER) 50 -313/99-004: Fuel Handling Area Ventilation System Flow Below TS Requirement While Irradiated Fuel Movement was in Progress**

On September 28, 1999, the flow rate of the fuel handling area ventilation system was below the TS requirement while irradiated fuel was being moved in the spent fuel pool. A rope had been installed to restrain the ventilation exhaust damper in the open position during an outage of the electrical bus that supplied power to the damper. However, the rope allowed the damper to close enough to cause a reduction in the ventilation flow rate. Installation of this rope was not addressed by the work plan for the bus outage or authorized under the administrative controls for temporary alterations. The licensee determined that the root causes of this condition were inappropriate work practices and a deficient work plan. TS 3.15 required that if the fuel handling area ventilation flow rate was not within 10 percent of the design value, irradiated fuel movement shall not be started (any irradiated fuel assembly movement in progress may be completed). The movement of irradiated fuel in the spent fuel pool with the ventilation system flow rate less than required by TS 3.15 was a violation of TS 3.1.5. This Severity Level IV violation is being treated as a noncited violation (50-313/9917-02), consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report 1-1999-0422.

**IV. Plant Support**

**R1 Radiological Protection and Chemistry Controls**

**R1.1 General Comments (71750)**

During routine tours of the plant and observations of plant activities, the inspectors noted that radiation protection personnel were properly performing their duties and areas were properly posted. Plant personnel were implementing proper radiation worker practices and adhering to radiation work permit requirements. The inspectors noted that on December 1, the Unit 1 auxiliary building ventilation system was secured for maintenance activities. The lack of ventilation resulted in a higher than normal concentration of noble gases in the Unit 1 auxiliary building. The inspectors noted that the health physics technicians at the controlled access exit point provided good oversight of the personnel who caused the radiation monitors to alarm when they attempted to exit the radiological control area. The inspectors noted health physics technicians continuously monitored personnel to ensure that all personnel properly cleared the monitor before exiting.

## V. Management Meetings

### **X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of the licensee's staff on December 21, 1999. The licensee acknowledged the findings presented.

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

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Bauman, Unit 2 Outage Management  
E. Christian, Unit 1 Instrumentation and Control Superintendent  
B. Day, Unit 1 Acting Director, Engineering  
B. Haylock, Unit 1 Electrical Maintenance  
T. Ivy, Unit 2 Senior Lead Engineer  
D. James, Manager, Licensing  
M. Little, Unit 1 Operations Manager  
T. Mitchell, Unit 2 Operations Manager  
D. Phillips, Unit 1 Supervisor  
S. Pyle, Licensing Specialist  
D. Scheide, Licensing  
H. Williams, Jr., Superintendent, Plant Security  
C. Zimmerman, Unit 1 Plant Manager

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observations
71707	Plant Operations
71750	Plant Support Activities
92700	Onsite follow up of LERs

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

URI	50-313/9917-01	NOED for OTSG tube defect (Section M1.1)
NCV	50-313/9917-02	Fuel Handling Area Ventilation System Flow Below TS Requirement While Irradiated Fuel Movement was in Progress (Section M8.1)

Closed

LER	50-313/99-004	Fuel Handling Area Ventilation System Flow Below TS Requirement While Irradiated Fuel Movement was in Progress (Section M8.1)
NCV	50-313/9917-02	Fuel Handling Area Ventilation System Flow Below TS Requirement While Irradiated Fuel Movement was in Progress (Section M8.1)

LIST OF ACRONYMS USED

LER	licensee event report
LPI	low pressure injection
NOED	Notice of Enforcement Discretion
NRC	Nuclear Regulatory Commission
OTSG	once through steam generator
P&ID	pipng and instrumentation drawing
RB	reactor building
TS	Technical Specification