

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.: 50-313; 50-368
License Nos.: DPR-51; NPF-6
Report No.: 50-313/98-07; 50-368/98-07
Licensee: Entergy Operations, Inc.
Facility: Arkansas Nuclear One, Units 1 and 2
Location: 1448 S. R. 333
Russellville, Arkansas 72801
Dates: August 2 through September 12, 1998
Inspectors: K. Kennedy, Senior Resident Inspector
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Project Branch C
Division of Reactor Projects
ATTACHMENT: Supplemental Information

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EXECUTIVE SUMMARY

Arkansas Nuclear One, Units 1 and 2
NRC Inspection Report 50-313/98-07; 50-368/98-07

This routine announced inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection.

Operations

- Good housekeeping practices and component material condition was noted in the Unit 1 Train A reactor building spray pump room. The system valve lineup was in accordance with the procedure. Components in the field were properly identified and labeled as denoted on Piping and Instrumentation Diagram (P&ID) M-236 and in Procedure 1104.005 (Section O2.1).
- Unit 2 Train A emergency diesel generator (EDG) was aligned and maintained in accordance with station procedures. No material deficiencies were noted that had the potential to impact system operation (Section O2.2).

Maintenance

- Units 1 and 2 maintenance activities were performed professionally by qualified workers knowledgeable of their assigned tasks and diagnostic equipment. Technicians demonstrated good as low as is reasonably achievable (ALARA) practices during the activities observed (Section M1.1).
- Units 1 and 2 surveillance activities were performed in accordance with approved procedures by knowledgeable personnel who demonstrated good communication, self-checking, and peer-checking skills. Good system engineering involvement was observed during surveillance activities (Section M1.2).
- Knowledgeable, qualified technicians performed 4160 volt circuit breaker maintenance on Unit 2 using approved procedures (Section M1.3).
- Unit 2 Technical Specifications were entered when a technician interrupted power to reactor vessel level monitoring system (RVLMS) Channel 1 by utilizing an uncontrolled power strip located inside the system cabinet which also powered system components. The licensee missed an opportunity to prevent the loss of RVLMS Channel 1 power when they initiated system specific corrective actions for a similar event that occurred in 1996 (Section M1.4).

Engineering

- Chemistry technicians demonstrated a good questioning attitude when they identified water discharging from the shared Units 1 and 2 emergency cooling pond spillway when the water level was below the top of the dam. The licensee promptly investigated the condition and found it to be normal for the water level (Section E1.1).

Plant Support

- Two deficient air sampling charcoal cartridge holders were left in service when Units 1 and 2 radiation protection technicians failed to review radiation work permits to identify deficient inservice iodine sample holders. A review of the operating and radiological conditions relevant to the inservice sample holder indicated that an unmonitored release to the work space had not occurred (Section R1.2).

Report Details

Summary of Plant Status

Unit 1

Unit 1 began the inspection period at 100 percent power. On August 8, 1998, for approximately 3 hours, and on September 11 for approximately 5 hours, power was reduced to 85 percent for monthly turbine valve testing. On August 15, power was reduced to 95 percent for approximately 1 hour to support circulating water bay cleaning at the intake structure. The unit was operating at 100 percent power at the end of the inspection period.

Unit 2

Unit 2 began the inspection period at 100 percent power. On August 8, power was reduced to 95 percent for approximately 5 hours to support quarterly turbine valve testing. The unit was operating at 100 percent power at the end of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors observed various aspects of plant operations, including compliance with Technical Specifications, conformance with plant procedures and the Safety Analysis Report, and shift manning. Inspectors also observed the effectiveness of communications, management oversight, proper system configuration and configuration control, housekeeping, and operator performance during routine plant operations and surveillances.

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

O2 Operational Status of Facilities and Equipment

O2.1 Unit 1 - Engineered Safety Feature Walkdown of Train A Reactor Building Spray System

a. Inspection Scope (71707)

The inspectors performed a detailed walkdown of the accessible portion of the Unit 1 Train A reactor building spray system.

b. Observations and Findings

The inspectors reviewed Procedure 1104.005, Revision 37, "Reactor Building Spray System Operation," and P&ID M-236, Sheet 1, Revision 85, "Reactor Building Spray and Core Flooding Systems." The inspectors verified that the Procedure 1104.005 valve lineup matched P&ID M-236 for the Train A reactor building spray system. The inspectors walked down the Train A reactor building spray system using Procedure 1104.005 and P&ID M-236. The inspectors found components in the field were properly labeled, identified, and accurately denoted on P&ID M-236 and that the valve lineup was in accordance with Procedure 1104.005 and P&ID M-236. The inspectors also verified locked valves required by Procedure 1104.005 and found no deficiencies.

The inspectors found that good housekeeping practices were being maintained in the reactor building spray pump room. No equipment conditions that might degrade system performance were identified during the walkdown.

c. Conclusions

Good housekeeping practices and component material condition was noted in the Unit 1 Train A reactor building spray pump room. The system valve lineup was in accordance with the procedure. Components in the field were properly identified and labeled as denoted on P&ID M-236 and in Procedure 1104.005.

O2.2 Unit 2 - Engineered Safety Feature Walkdown of EDG

a. Inspection Scope (71707)

The inspectors performed a detailed walkdown of accessible portions of the Unit 2 EDGs. Walkdowns included a review of valve and electrical lineups for the EDGs and supporting equipment.

b. Observations and Findings

The inspectors reviewed Procedure 2104.036, Revision 42, "Emergency Diesel Generator Operation;" Unit 2 Safety Analysis Report, Section 8.0; Technical Specifications; Regulatory Guide 1.108; and Piping Drawing M-2217, Revision 52, "Diesel Generator Fuel Oil System."

The inspectors found that the accessible system mechanical and electrical components were aligned in accordance with procedures. Component labeling was verified and no discrepancies were noted. Housekeeping practices and component material condition was satisfactory.

c. Conclusions

Unit 2 Train A EDG was aligned and maintained in accordance with station procedures. No material deficiencies were noted that had the potential to impact system operation.

O8 Miscellaneous Operations Issues (92700, 92901)

O8.1 (Closed) Inspection Followup Items (IFI) 50-313/9701-01, "Administrative Control of Containment Penetration Vent and Drain Line Valves"

The inspectors initiated this IFI during the closure of Violation 50-313/9407-01 to provide further review of the licensee administrative controls for vents and drains that penetrate the reactor building. The inspectors reviewed Procedure 1015.034, Revision 4, "Containment Penetration Administrative Control," and Procedure 1015.041, Revision 6, "Unit 1 Containment Penetration Administrative Control," and concluded that the licensee had implemented permanent administrative controls for vent and drain line valves on piping that penetrate the reactor building.

O8.2 (Closed) Violation 50-368/9509-01, "Lack of Temporary Modification for Connecting Shutdown Cooling Heat Exchanger Service Water Drains"

The licensee had cross-connected the service water side of the shutdown cooling heat exchangers through the service water drain valves using a configuration that did not conform with approved drawings, without considering the system a temporary modification. The inspectors verified the immediate and long-term corrective actions described in the licensee's letter dated February 6, 1996, and found them to be adequate and complete.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following maintenance activities:

- Unit 1 - Job Order (JO) 00960109, "Perform Diagnostic Testing of Emergency Feed Water Pump to Steam Generator B Discharge Isolation Valve CV-2620," performed on September 1.
- Unit 1 - JO 00981234, "Inspect, Clean, Lubricate, Megger Motor, Check for Leakage of Valve, and Lubricate Valve Stem for Valve CV-2620," performed on September 1.
- Unit 2 - JO 00972810, Procedure 1412.001, Revision 9, "Preventative Maintenance or Limitorque SB/SMB Motor Operators," performed on September 1.

b. Observations and Findings

The activities that the inspectors observed were conducted professionally and thoroughly. Work was performed according to procedures. The workers were knowledgeable of their assigned tasks and diagnostic equipment. The inspectors noted that the workers properly stopped work when problems were encountered with the diagnostic equipment. On one occasion, technicians promptly identified a faulty equipment cable and replaced the cable prior to proceeding with the work. The inspectors observed maintenance supervisory involvement during these activities. Maintenance personnel involved demonstrated good ALARA practices and radiation worker knowledge.

c. Conclusions

Units 1 and 2 maintenance activities were performed professionally by qualified workers knowledgeable of their assigned tasks and diagnostic equipment. Technicians demonstrated good ALARA practices during the activities observed.

M1.2 General Comments on Surveillance Activities

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillance activities:

- Unit 1 - Procedure 1304.128, Revision 12, "RPS-D/CRD Breaker Trip Test," performed on August 4.
- Unit 1 - Procedure 1304.208, Revision 3, "Unit 1 EFIC Channel D Monthly Test, SG Pressure Greater Than 750 PSIG," performed on August 4.
- Unit 1 - Procedure 1607.017, Revision 5, "Sampling the Borated Water Storage Tank," performed on August 26.
- Unit 1 - Procedure 1605.005, Revision 5, "Determination of Boron," performed on August 26.
- Unit 1 - Procedure 1104.036, Revision 42, "Emergency Diesel Generator Operations," Supplement 2, "DG2 Monthly Test," performed on August 31.
- Unit 2 - Procedure 2104.036, Revision 42, "Emergency Diesel Generator Operations," Supplement 2A, "2DG2 Monthly Test (Slow Start)," performed on August 5.

b. Observations and Findings

The inspectors found that surveillance activities were performed in accordance with approved procedures by knowledgeable personnel using calibrated test equipment. Licensee personnel demonstrated good communications, self-checking, and

peer-checking techniques. System engineering personnel observed system performance during the surveillance testing and demonstrated good attention to detail when monitoring for abnormal conditions. During interviews with the system engineers involved in the observed surveillances, the inspectors found them knowledgeable of deficiencies associated with their assigned system and that they had verified that the deficiencies would not impact system operability. The equipment performed as required and data met the required acceptance criteria.

c. Conclusions

Units 1 and 2 surveillance activities were performed in accordance with approved procedures by knowledgeable personnel who demonstrated good communication, self-checking, and peer-checking skills. Good system engineering involvement was observed during surveillance activities.

M1.3 Unit 2 - 4160 Volt Breaker Maintenance

a. Inspection Scope (62707)

On August 26, 1998, the inspectors observed 4160 volt breaker maintenance performed on Breaker 2A310, the "Vital Busses 2A3 and 2A4, cross tie breaker" for Unit 2. Maintenance was performed in accordance with Procedure 1416.040, Revision 2, "Magna-Blast Circuit Breaker Maintenance," and JO 00979698.

b. Observations and Findings

The inspectors reviewed the applicable procedure, interviewed technicians, and monitored the maintenance activity. Technicians were knowledgeable of the design and operation of the breaker. When the work area was left unattended, technicians secured the breaker and equipment carts to ensure immobility during a seismic event. Proper controls of cleaning fluids and combustibles were observed. Procedural compliance, place keeping, and required signatures on the data sheet were accomplished as the tasks and steps were performed.

c. Conclusions

Knowledgeable, qualified technicians performed 4160 volt circuit breaker maintenance on Unit 2 using approved procedures.

M1.4 Unit 2 - Loss of Power to the RVLMS

a. Inspection Scope (62707)

The inspectors reviewed conditions relating to a loss of power to Unit 2 RVLMS Channel 1 that rendered the channel inoperable on August 31, 1998.

b. Observations and Findings

On August 31, while performing routine cleaning and inspection of the RVLMS cabinet performed under JO 00979C45, "Vibration and Loose Parts Monitoring Panel, Cabinets 2C19 and 2C3888-1/2 Clean and Inspect," a technician plugged a vacuum cleaner into a power strip mounted in the cabinet. The power strip was designed to provide electricity to the RVLMS control power supply modules and not intended to supply external loads. The load, resulting from the operation of the vacuum cleaner, was sufficient to cause the power supply protective fuse to blow. This resulted in a loss of control power to RVLMS Channel 1 and entry into Technical Specification 3.3.3.6. There are two channels of RVLMS. Each channel is powered from separate safety-related busses. The RVLMS system is utilized as an indication of reactor vessel water level during postaccident conditions and provides no automatic functions. During the loss of Channel 1 RVLMS, Channel 2 was available for indication in the unlikely event of an accident. Additionally, the loss of one channel of RVLMS has no impact on routine power operations.

The inspectors reviewed Condition Report 2-1998-0340 for this event, related Condition Reports 2-1997-0132 and C-1996-0227, interviewed the licensee, and observed the configuration in the affected cabinet. The power strip located within the cabinet did not have any protective covers or warning labels that would prevent a technician from plugging a nonsafety-related component into the supply. The work instructions did not contain cautions to preclude the event from occurring. The licensee indicated that the technician was not aware that the strip was intended only for use as a system power supply. The inspectors interviewed the maintenance supervisors who estimated that as many as 30 cabinets contained various receptacles and that a similar configuration to the RVLMS power strip existed in a minimum of five locations.

The inspectors determined that Condition Reports 2-1997-0132 and C-1996-0227 identified similar occurrences. Specifically, C-1996-0227, dated September 11, 1996, identified a loss of the safety parameter display system power when a worker plugged a heat gun into an electrical outlet supplied from the same source as the system. The inspectors concluded that the licensee missed an opportunity to prevent the loss of RVLMS when they did not recognize that the condition associated with Condition Report C-1996-0227 was more extensive and potentially affected other systems. Although these problems had no safety significance, they represent weak corrective action.

c. Conclusions

Unit 2 Technical Specifications were entered when a technician interrupted power to RVLMS Channel 1 by using an uncontrolled power strip located inside the system cabinet that also powered system components. The licensee missed an opportunity to prevent the loss of RVLMS Channel 1 power when they initiated system specific corrective actions for a similar event that occurred in 1996. The problems had no safety significance, but they represent isolated examples of weak corrective action.

M8 Miscellaneous Maintenance Issues

- M8.1 (Closed) Licensee Event Report (LER) 50-313/96-010, "Inadequate Procedure Revision Resulted in Not Having Tested the Reactor Protection System High Temperature Trip Function as Required by TSs"

The inspectors verified the immediate and long-term corrective actions described in the licensee's letter dated December 19, 1996, and found them to be adequate and complete. This nonrepetitive, licensee-identified, and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

- M8.2 (Closed) LER 50-368/96-005-01, "Surveillance Testing of Plant Protection System and Postaccident Monitoring Instrumentation"

The inspectors verified the immediate and long-term corrective actions described in the licensee's letter dated January 30, 1997, and found them to be adequate and complete. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

III. Engineering

E1 Conduct of Engineering

- E1.1 Units 1 and 2 - Operability of Emergency Cooling Pond

a. Inspection Scope (37551)

The licensee identified a possible deficiency associated with the emergency cooling pond which serves as the ultimate heat sink for Units 1 and 2. The inspectors observed the condition and reviewed the operability and system design with engineering personnel.

b. Observations and Findings

On August 24, 1998, while making preparations for chemical treatment of the emergency cooling pond, the licensee lowered level to the top of the overflow spillway to prevent chemicals from entering Lake Dardannell. Chemistry technicians noticed that a small amount (less than 2 gpm) of water continued to seep from the seams in the concrete erosion barriers that overlay the spillway. The technicians properly questioned this and submitted Condition Report CR-C-98-0212 which documented their concern.

The inspectors observed the condition and reviewed the licensee's operability assessment of the water seeping from the emergency cooling pond concrete erosion blocks. The construction of the spillway consists of clay underlayer, a permeable overlay that minimizes erosion of the clay and allows water to penetrate, solidifying the clay layer, concrete erosion blocks on top of the overlayment, and finally a plastic tarpaulin type covering over the concrete that provides additional erosion protection

when water flows over the concrete. The inspectors reviewed the configuration of the spillway, the lake level, and the location and amount of water seepage and concluded that the licensee's operability determination accurately reflected the condition. Although the level of water in the pond was slightly below the top of the concrete, the licensee concluded that, because the pond level was above the bottom of the concrete blocks, a tortuous flow path between the blocks existed that allowed water to migrate through the joints between the blocks and over the spillway.

c. Conclusions

Chemistry technicians demonstrated a good questioning attitude when they identified water discharging from the shared Units 1 and 2 emergency cooling pond spillway when the water level was below the top of the dam. The licensee promptly investigated the condition and found it to be normal for the water level.

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 found that access doors to locked high radiation areas were properly locked, areas were properly posted, and personnel demonstrated proper radiological work practices.

R1.2 Units 1 and 2 - Radiation Monitoring at Reactor Coolant Sample Sink

a. Inspection Scope (71707)

On August 26, 1998, the inspectors observed chemistry technician radiological practices while establishing valve lineup in preparation for performance of Procedure 1607, Revision 13, "Reactor Coolant Sampling System."

b. Observations and Findings

The inspectors observed radiological practice conducted per Radiation Work Permit 98-008 when technicians were aligning the reactor coolant sampling system in preparation for performing of Procedure 1607.001. Technicians demonstrated good contamination control practices. The sample sink was configured with an exhaust hood that is maintained under negative pressure to preclude radioactive gasses and particles from entering the work space. Air samplers were prestaged at the sample sink in accordance with Radiation Work Permit 98-008 to provide monitoring for iodine and particulate during sample activities.

The inspectors noted that air sampling charcoal cartridge holders were configured such that air could bypass the charcoal cartridge due to a missing gasket in the sample head. This condition would lessen the efficiency of the sample cartridge, possibly yielding

inaccurate samples. The licensee took actions at that time to remove deficient cartridges from service. The inspectors questioned the chemistry technicians about the deficiency identified during the week before. Technicians were aware of the problem and indicated that they had been informed that health physics had removed all of the deficient holders. The inspectors asked the technicians to check the holders located at the Units 1 and 2 sample sinks and noted that both were missing gaskets and o-rings. Upon noting the problem, plant staff promptly replaced the defective sample holders.

The inspectors discussed the condition with the health physics department. Health physics indicated that they had failed to cross-reference radiological work permits to prestaged sample holders and had only removed deficient sample holders located at the controlled access and in spares. Subsequently, health physics reviewed radiation work permits and other potential locations for sample holders and found that the two holders in the chemistry lab were the only oversights.

The licensee determined that no negative fuel performance trends or positive iodine samples had occurred subsequent to both units' refueling outage. They noted that the installed ventilation maintained the sample sink at a negative pressure and that iodine sample cartridge bypass flow was minimal. Based upon this information, the licensee concluded that no unmonitored releases to the work space at the reactor coolant system sample station had occurred. The failure to priorly identify these two sample holders as defective did not result in an unmonitored release and did not constitute a safety issue.

c. Conclusions

Two deficient air sampling charcoal cartridge holders were left in service when Units 1 and 2 radiation protection technicians failed to review radiation work permits to identify deficient inservice iodine sample holders. A review of the operating and radiological conditions relevant to the inservice sample holder indicated that an unmonitored release to the work space had not occurred.

S1 Conduct of Security and Safeguards Activities

S1.1 Conduct of Security (71750)

During this period, the inspectors observed personnel and package access, personnel searches, and applications of temporary lighting in areas where equipment, components, and truck trailers were stored. The inspectors' review of security measures and operations periodically throughout the inspection period indicated that they were properly implemented.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 15, 1998. The licensee acknowledged the findings presented.

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

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Allen, Unit 2 Maintenance Manager
C. Anderson, General Plant Manager
G. Ashley, Licensing Supervisor
B. Bamant, Unit 2 Plant Manager
B. Beard, Unit 2 Electrical Superintendent
bR. Carter, Maintenance Superintendent
M. Chisum, Unit 2 System Engineering Manager
M. Cooper, Licensing Specialist
P. Harris, Unit 1 Operations
B. Haylock, Unit 1 Electrical Maintenance
D. James, Acting Director, Nuclear Safety
J. Kowalewski, Unit 1 System Engineering Manager
R. Lane, Design Engineering Director
J. Vandergriff, Nuclear Safety Director
R. Walters, Unit 1 Assistant Operations Manager
H. Williams, Plant Security Superintendent
C. Zimmerman, Unit 1 Plant Manager

INSPECTION PROCEDURES USED

IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71750: Plant Support Activities
IP 92700: Onsite Followup of Written Reports
IP 92901: Followup - Operations
IP 92903: Followup - Engineering
IP 93702: Prompt Onsite Response to Events at Operating Power Reactors

ITEMS CLOSED

50-368/9509-01	VIO	Lack of Temporary Modification for Connecting Shutdown Cooling Heat Exchanger Service Water Drains (Section 08.2)
50-313/96-005-01	LER	Surveillance Testing of Plant Protection System and Postaccident Monitoring Instrumentation (Section M8.2)

50-368/96-010	LER	Inadequate Procedure Revision Resulted in Not Having Tested the Reactor Protection System High Temperature Trip Function as Required by Technical Specifications (Section M8.1)
50-313/9701-01	IFI	Administrative Control of Containment Penetration Vent and Drain Line Valves (Section 08.1)

LIST OF ACRONYMS USED

ALARA	as low as is reasonably achievable
EDG	emergency diesel generator
IFI	inspection followup item
JO	job order
LER	licensee event report
P&ID	pipng and instrumentation diagram
RVLMS	reactor vessel level monitoring system