APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/88-20
50-368/88-20

Licenses: DPR-51
NPF-6

Dockets: 50-313
50-368

Licensee: Arkansas Power & Light Company
P. O. Box 551
Little Rock, Arkansas 72203

Facility Name: Arkansas Nuclear One (ANO), Units 1 and 2

Inspection At: ANO Site, Russellville, Arkansas

Inspection Conducted: June 1 through June 30, 1988

Inspectors: W D Johnson
W. D. Johnson, Senior Resident Reactor Inspector — 7/6/88 Date

R.C. Haag
R. C. Haag, Resident Reactor Inspector — 7/7/88 Date

Approved: D. D. Chamberlain
D. D. Chamberlain, Chief, Reactor Project Section A, Division of Reactor Projects — 7/28/88 Date

Inspection Summary

Inspection Conducted June 1-30, 1988 (Report 50-313/88-20)

Areas Inspected: Routine, unannounced inspection including operational safety verification, maintenance, surveillance, and temporary instructions.

Results: Within the four areas inspected, two violations were identified (failure to provide timely corrective action, paragraph 3; and failure to properly control the design criteria of a plant modification, paragraph 5).

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Results: Within the four areas inspected, one violation was identified (failure to provide timely corrective action, paragraph 3).

DETAILS

1. Persons Contacted

AP&L

*J. Levine, Executive Director, ANO Site Operations
W. Butzlaff, Quality Assurance Supervisor
*A. Cox, Unit 1 Operations Superintendent
E. Ewing, General Manager, Technical Support
L. Gulick, Unit 2 Operations Superintendent
C. Halbert, Engineering Supervisor
D. Harrison, Plant Engineer
D. Howard, Licensing Manager
*L. Humphrey, General Manager, Nuclear Quality
G. Kendrick, I&C Maintenance Superintendent
*R. Lane, Engineering Manager
*D. Lomax, Plant Licensing Supervisor
A. McGregor, Engineering Services Supervisor
*J. McWilliams, Maintenance Manager
*P. Michalk, Licensing Engineer
V. Pettus, Mechanical Maintenance Superintendent
D. Provencher, Quality Assurance Supervisor
*S. Quennoz, General Manager
P. Rehm, Mechanical Maintenance Engineer
C. Shively, Plant Engineer Superintendent
C. Taylor, Unit 2 Operations Technical Support Supervisor
J. Taylor-Brown, Quality Control Superintendent
L. Taylor, Special Projects Coordinator
J. Teeter, Operations Technical Support
R. Tucker, Electrical Maintenance Superintendent
*J. Vandergrift, Operations Manager
C. Zimmerman, Unit 1 Operations Technical Support Supervisor

*Present at exit interview.

The NRC inspectors also contacted other plant personnel, including operators, technicians, and administrative personnel.

2. Plant Status (Units 1 and 2)

Unit 1 operated at near 85 percent power and Unit 2 at 100 percent power throughout the month of June 1988.

3. Operational Safety Verification (71707, 71709, 71710, and 71881) (Units 1 and 2)

The NRC inspectors observed control room operations, reviewed applicable logs, and conducted discussions with control room operators. The NRC

inspectors verified the operability of selected emergency systems, reviewed tag-out records and verified proper return to service of affected components, and ensured that maintenance requests had been initiated for equipment in need of maintenance. The NRC inspectors made spot checks to verify that the physical security plan was being implemented in accordance with the station security plan. The NRC inspectors verified implementation of radiation protection controls during observation of plant activities.

The NRC inspectors toured accessible areas of units to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibration. The NRC inspectors also observed plant housekeeping and cleanliness conditions during the tours.

The NRC inspectors walked down the accessible portions of the Unit 1 electrical system to verify operability. The walkdown was conducted using various checklists of licensee Procedure 1107.01, "Electrical System Operations," Revision 28. During the walkdown inspection, the following items were identified. The licensee was informed of these items so corrective action could be taken.

- Procedure 1107.01 lists the desired position of spare Breaker 5733 as open, however, the breaker was actually closed. The licensee stated the breaker will be opened.

- The description of Breaker H-25 in Procedure 1107.01 and on the breaker label was incorrect. The description should be "Startup Transformer #1 Supply to H-2" in lieu of "Startup Transformer #1 Supply to H-1." The licensee has corrected the breaker labeling which was an apparent typographical error.

- The descriptions for Breakers 24 and 52 on Panel Y01 and Breakers 24 and 52 on Panel Y02 in Procedure 1107.01 did not match the breaker label description. The licensee has stated the description in the procedure will be revised for clarity.

- 125 VDC Panel D11 had several breakers with two different breaker numbers attached to the individual breakers. The correct breaker numbers were listed but in some cases an additional outdated number was also listed. The licensee has corrected the breaker numbering.

- The description in Procedure 1107.01 for Breaker 11 on Panel RS-1 listed two different loads for the breaker; however, the breaker label lists only one load. The licensee has stated the breaker label will be updated to reflect both loads.

- Breaker No. 41 on Panel Y02 is listed as a spare with the desired position as open in Procedure 1107.01. The breaker was closed with the label description, T/C Signal Converter T-08A. The licensee has stated the breaker label will be corrected to reflect the breaker is a spare, and that the breaker will be opened.

- In Procedure 1107.01 the description of Breaker No. 5531 included the word, (Future), and the desired position was listed as open. The breaker is actually closed. The licensee had a pending revision to this procedure to list the desired position as closed.

Similar minor examples of procedural/labeling deficiencies are noted in NRC Inspection Report 50-368/88-15. The licensee has an ongoing corrective action program in place to correct the kind of procedural/labeling deficiencies identified above. The NRC inspector noted that a recent change (Revision 33) to Procedure 1015.01, "Conduct of Operations," now provides instructions to identify and document procedural/labeling deficiencies during system alignments. While no violation will be cited at this time for the identified minor deficiencies, the effectiveness of the licensee's ongoing corrective action program will be monitored during future NRC inspections.

The NRC inspector also observed caution cards dated June 19, 1986, attached to breakers 0123 and 0124 on DC Bus, D01. The caution cards stated the breakers could not be operated with the outer breaker lever. To change the position of these breakers, an operator would have to open the front panel cover and move the actual breaker switch. In addition, Procedure 1203.02, "Alternate Shutdown," requires breaker 0124 to be opened under conditions that require plant shutdown outside the control room. During further review, the NRC inspector discoverd that the inability to operate the breakers with the outer breaker lever resulted from replacement of the breaker. Design Change Package 83-1032 which replaced breakers 0123 and 0124 was completed on April 14, 1985.

The licensee stated the delayed time period for correction of the deficiencies was attributed to incomplete repair parts during the last repair effort and the required scheduling of repairs during reactor shutdown. However, the NRC inspector was concerned with the excessive amount of time elapsed without these breakers being repaired, particularly when considering breaker 0124 will require operation during alternate reactor shutdown. Failure to promptly correct the breaker deficiency is an apparent violation (313/8820-01).

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under Technical Specifications, 10 CFR, and administrative procedures.

4. Monthly Surveillance Observation (61726) (Units 1 and 2)

The NRC inspector observed the Technical Specification required surveillance testing on the Unit 2 Emergency Diesel Generator 2K4B (Procedure 2104.36, Supplement 2) and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test

results conformed with Technical Specifications and procedure requirements, and that test results were reviewed by personnel other than the individual directing the test.

During the diesel generator run, the NRC inspector noted high fuel oil pressure in the range of 28-30 psi as indicated on gauge 2PI-2987A/B. The operator's logsheet provided the acceptable range of fuel oil pressure as 10-20 psi. The technical manual for diesel generators specifies a pressure of approximately 15 psi being built up and maintained in the fuel supply line. Job Order 728294 was issued in January 1987; however, due to replacement parts being incorrectly ordered, the repairs have not been completed. The NRC inspector questioned if an operability assessment had been performed for adverse effects associated with the higher than normal fuel oil pressure. The licensee could not provide evidence that the assessment had been performed concerning the higher than normal fuel oil pressure and effects on diesel generator operation. After subsequent discussions with the vendor, the licensee stated that fuel oil pressure in the range of 28-30 psi was acceptable for extended operations. The decision was made on the basis of an initial hydrostatic test of the fuel oil system to 50 psi and the vendor recommendation that fuel oil pressure of 30 psi was acceptable for diesel generator operation. Failure to promptly repair the high fuel oil pressure and to properly evaluate the significance of the high pressure is a second example of the violation in paragraph 3 (368/8820-01).

The NRC inspector also witnessed portions of the following test activities:

- Semi-annual test of Unit 2 containment personnel air lock for overall air leakage (Procedure 2304.022, Job Order 758018). The initial test provided an unacceptable leak rate of 9700 cc/minute. Following repairs (see maintenance section) a subsequent leak test was satisfactorily performed.

- Monthly test of diesel fuel from Emergency Diesel Fuel Tank T57B (Procedure 1618.010). The diesel fuel was checked for viscosity, water and sediment.

- Monthly test of Emergency Feedwater Pump 2P7B (Procedure 2106.006, Supplement II). During the surveillance an equalization valve for Test Gage 2FI-0798A was repositioned. The valve was not labeled. The NRC inspector noted that possible confusion could exist in identifying this equalization valve and an additional equalization valve for an adjacent gauge that was labeled "Equalization Valve." The licensee has subsequently labeled the equalization valve for Gauge 2FI-0798A. The NRC inspector also noted the procedure did not provide instructions for opening or closing the isolation valves for the local suction and discharge pressure gauges. The licensee is revising the procedure to provide operating instructions for the isolation valves.

- Monthly surveillance of Channel B Excore Instrumentation (Procedure 2304.101, Job Order 758015)

- Monthly test of Channel D of emergency feedwater initiation and control system (Procedure 1304.148, Job Order 759229)

- Monthly test of Emergency Diesel Generator 2K4A (Procedure 2104.36, Supplement 1)

- Semi-annual test of Unit 1 containment escape air lock for overall air leakage (Procedure 1304.020, Job Order 758010). The NRC inspector noted an electrical terminal box that was not mounted to the outer face of the air lock barrel. The terminal box was associated with the interlock features of the air lock. Job Order 760439 was issued to remount the terminal box and Condition Report 1-88-055 was written to determine the cause of the box not being mounted.

In addition, regional NRC inspectors witnessed portions of the following activities:

- Quarterly pressurizer level response test (Procedure 2103.05)

- Monthly control room emergency air condition system test (Procedure 2104.07)

No additional violations or deviations were identified.

5. Monthly Maintenance Observation (62703) (Units 1 and 2)

Station maintenance activities for the safety-related systems and components listed below were observed to ascertain that they were conducted in accordance with approved procedures, Regulatory Guides, and industry codes or standards; and in conformance with the Technical Specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and fire prevention controls were implemented.

Work requests were reviewed to determine the status of outstanding jobs and to ensure that priority is assigned to safety-related equipment maintenance which may affect system performance.

The following maintenance activities were observed/reviewed:

- Troubleshooting the dual position indication from CV-3840 limit switches (Job Order 758527). The lower limit switch was determined to be defective. The licensee initiated procurement of the replacement part.

- Fabrication and installation of a stem position indication rod on CV-1407 (borated water storage tank outlet valve) (Job Order 758205).

- Tube leak repairs on Drain Heater E8A (Job Order 758501). While this component is not safety-related, the NRC inspector observed portions of the repair and the isolation of the drain heater which required bypassing a portion of one feedwater train and reduction of reactor power to 60 percent.

- Investigation of air leakage on the Unit 2 personnel air lock (Job Order 3005.) Following the tightening of several plugs and packing adjustment on the hatch handwheel the subsequent air leakage test was performed satisfactory.

- Replacing upper motor bearing on Service Water Pump 2P-4A (Procedure 2403.04, Job Order 759142)

- Troubleshooting core protection calculators Channel A (Job Order 758677)

- Temporary modifications performed on the reed switch position transmitter signal for control element assemblies (CEA) Nos. 28 and 66 (Job Orders 759874 and 759945). This modification provides a continuous rod full out signal from one of the two reed switch position transmitters for each CEA. Prior to this modification the position transmitters were repeatedly providing spurious and incorrect output signals.

- Packing repair of CV-2617 (isolation valve in supply steam line to emergency feedwater pump turbine) (Job Order 759073). Sealant was injected into the packing area to stop a steam leak. Procedure 1025.015, "On Line Repair Procedures" which was referenced in the job order, does not have a specific task which correlates with the method used for sealant injection. This and several other minor comments concerning the procedure were identified to the licensee.

- Troubleshooting the failed high Steam Generator B high range level indication (Job Order 759835). Transmitter LT-2673 which provides input to Channel B of the emergency feedwater initiation and control system was determined as the cause of the failed high level indication. Due to the location of LT-2673 in the reactor building, the licensee evaluated various accident senarios with LT-2673 failed

high and concluded continued operations with LT-2673 failed high was justified. The licensee has prepared plans to investigate LT-2673 failure during the next unit shutdown.

- Service Water Check Valve SW-1A seat leakage repair (Job Order 797184). Due to the extent of repairs, Plant Change 88-1919 was issued for the plant modification involving parts replacement. A new hinge pin with a larger diameter was installed to reduce the excessive movement of the joint. The new pin was manufactured from 304 stainless steel barstock with a yield strength of 30 ksi. The original hinge pin was 416 stainless steel with a yield strength of 40 ksi. The engineering justification used for the decrease of yield strength was based on increasing the new pin diameter 1/8 inch. This would result in a cross sectional area increase of 26 percent that would offset the reduced yield strength.

  The fabrication instruction in the plant change did not specify a 1/8-inch increase in pin diameter but required the new pin be machined to fit the smallest dimension of the mating parts. During observation of the repair, the NRC inspector questioned the machinist on the actual increase in pin diameter and learned the pin was increased only 1/16 inch. Later the NRC inspector questioned the plant engineer if he had received information on the actual increase in pin diameter and taken steps to modify the engineering justification used for the decrease in yield strength. The engineer had not received notice from the field concerning a change in the basis (diameter increase of 1/8 inch) used in the engineering justification nor did the plant change have a means for identifying this information. Following the questioning by the NRC inspector, the licensee performed a detailed calculation to verify the new pin was acceptable. The NRC inspector was concerned with the broader implication of this modification in that a change to the basis used in the justification of a design change, if not specifically delineated in the plant change, may not be identified to the engineer. The NRC inspector reviewed Procedure 1032.01, Plant Engineering Action Requests and Plant Changes, and Procedure 1032.02, Installation Technical Support. These procedures provide instructions for the plant change process, including the closeout process; however, they do not provide instructions to ensure a change to a basis in the justification of a design change is properly identified. This procedural concern is an apparent violation of 10 CFR 50, Appendix B, Criteria III, Design Control, which requires the establishment of measures to assure that applicable regulatory requirements and design basis are correctly translated into specifications, drawings, procedures and instructions (313/8820-02).

6. Verification of Changes Made to Comply With PWR Moderator Dilution Requirements (Temporary Instruction 2515/94) (Unit 1)

The NRC inspector reviewed the licensee's response concerning the analysis of the potential for, and the consequences of, a boron dilution accident

for Unit 1. Only one situation was identified in which a single valve failure would allow a boron dilution accident due to NaOH injection in the reactor coolant system. This event could have occurred when filling the refueling canal by way of the low pressure injection system and when testing the NaOH control valves. In this response the licensee stated that operating procedures had been changed to require an additional valve to be manually closed during NaOH control valve testing. The NRC inspector verified that Supplement II to Procedure 1104.005, Reactor Building Spray System Operation, requires valve CA-49 be closed when testing the NaOH control valves if using the low pressure injection system to fill the refueling canal.

No violations or deviations were identified.

7. Verification of Quality Assurance (QA) Regarding Diesel Generator (DG) Fuel Oil (Temporary Instruction 2515/93) (Units 1 and 2)

The NRC inspector reviewed the licensee's QA Manual for operations to determine if DG fuel oil is included in the QA program. While DG fuel oil is not listed on the summary Q-lists that are located in the safety analysis reports or on the component level Q-lists, quality assurance is provided under the controls of expendable and/or consumable items. These controls verify compliance with Technical Specifications and additional standards identified by the licensee. The NRC inspector reviewed the following procedures:

- 1618.010 Sampling Diesel Fuel ANO-1
- 1618.035 Diesel Fuel Oil Transport Sample
- 2618.005 Sampling Diesel Fuel ANO-2

In addition to these required tests, the licensee has initiated quarterly testing of DG fuel oil for compliance with the DG vendor recommended fuel oil requirement. The licensee has also implemented a program of recycling and filtering the fuel oil in the emergency diesel fuel oil tanks on an 18-month basis. QA involvement with these activities is commensurate with other safety-related activities. As a result of this inspection, the NRC inspector found that the licensee has included DG fuel oil in the QA program.

No violations or deviations were identified.

8. Exit Interview

The NRC inspectors met with Mr. J. M. Levine, Executive Director, Nuclear Operations, and other members of the AP&L staff at the end of the inspection. At this meeting, the inspectors summarized the scope of the inspection and the findings.