APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-313/88-28 Operating Licenses: DPR-51
50-368/88-28 NPF-6

Dockets: 50-313
50-368

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

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

Inspection At: ANO, Russellville, Arkansas

Inspection Conducted: August 22-26, 1988

Inspectors: W. C. Seidle for 9/26/88
T. O. McKernon, Reactor Inspector, Test Programs Section, Division of Reactor Safety — Date

Accompanying Personnel: R. V. Azua, Reactor Inspector, Test Programs Section, Division of Reactor Safety

Approved: W. C. Seidle 9/26/88
W. C. Seidle, Chief, Test Programs Section, Division of Reactor Safety — Date

Inspection Summary

Inspection Conducted August 22-26, 1988 (Report 50-313/88-28; 50-368/88-28)

Areas Inspected: Routine, unannounced inspection of the licensee's monthly surveillance testing program, followup to previous inspection findings, operational safety verification, onsite followup to events, and 10 CFR Part 21 items followup.

Results: Within the five areas inspected, one violation was identified (failure to take prompt corrective action, paragraph 6.0).

DETAILS

1.0 Persons Contacted

AP&L

*J. D. Vandergrift, Operations Manager
*A. Cox, Operations Superintendent
*P. Michalk, Licensing Engineer
*D. Howard, Licensing Manager
*R. Wewers, Work Control Center Manager
*J. L. Taylor-Brown, QC/QE Superintendent
*R. Lane, Engineering Manager
M. Little, Shift Superintendent
W. Converse, Plant Assessment Analysis Section

*Denotes those attending the exit interview on August 26, 1988

2.0 Followup on Previously Identified Inspection Findings (92701)

2.1 Violations

2.1.1 (Closed) Violation (313/8617-01; 368/8618-01): The violation concerned inadequate maintenance procedures.

The NRC inspector verified that the corrective actions were conducted as proposed in the licensee's response, dated August 29, 1986. The recommended maintenance schedule for the Emergency Feedwater Pump Terry Turbine was received from Terry Corporation, evaluated and incorporated into the Preventive Maintenance Tasks and Procedures for ANO-2. ANO-1 already had a schedule in the technical manual for its turbine. In response to NRC Generic Letter 83-28 Item 2.2.2, a programmatic review of the preventive maintenance program was performed. The review process included an evaluation of the vendor technical information to be utilized or the development and periodic review of maintenance procedures.

2.1.2 (Closed) Violation (313/8618-02; 368/8619-02): The violation concerned inadequate procedures.

The inadequacy of these procedures was deemed to be caused by an inadequate procedure review process. The NRC inspector verified that the corrective actions were conducted as proposed in the licensee's response (OCAN03870F, AP&L letter from J. Ted Enos, Manager, Nuclear Engineering & Licensing, to J. E. Gagliardo, Chief, Reactor Projects Branch), dated March 11, 1987. Procedure 1000.06, Rev. 27, "Procedure Review, Approval and Revision Control," had been upgraded to include a validation process. This, in a sense, created a three-tiered review process. The first is by an independent

reviewer; the second is by a validation reviewer, who must fill out a validation questionnaire (Yes and No questions; if any questions are answered negatively, the procedure is sent back to the writer for corrections). Finally, the procedure is sent to the department supervisor who will verify the technical content of the procedure. All three steps require signoffs. The review process looked at both technical content and procedure readability. In addition, Procedure Writers Guides have been introduced to several departments. These guides instruct writers in procedure standardization, proper use of tables, drawings and graphs, and proper writing methods to make procedural steps more easily understood. The plant operations and maintenance departments both have procedures which require each member to review the writers guides periodically. The maintenance department procedure (1025.08, "Control of Maintenance Procedure Writers Guide") also requires a signoff sheet to be filled in each time a member reads the guide. A workshop is periodically held to keep members up to date.

2.1.3 (Closed) Violation (313/8732-04; 368/8732-02): The violation concerned the failure to include the provisions of an Order for Modification of License and the accompanying technical evaluation report in the development of a procedure. This violation involved the failure of the licensee to incorporate hydrostatic pressure criteria in the procedures for periodic valve leakage testing.

During the following inspection, the NRC inspector verified that the licensee had revised the surveillance test procedures to include provisions for testing at the maximum normal operating pressure (2250 psia) and for adjusting leakage rates for tests conducted at lower pressures. Furthermore, the licensee had revised the procedure to correct instrumentation tolerance to ensure proper conduct of the surveillance test.

2.1.4 (Closed) Violation (368/8803-01): The violation concerned inadequate review and improper control of station drawings. The NRC inspector verified that the corrective actions were conducted as proposed in the licensee's response dated June 3, 1988. The isometric drawings had been corrected and an audit, performed by the licensee's Quality Control Department, identified other drawings of poor quality, which were subsequently reissued. The Plant Modifications Manager issued a directive (ANO-88-2-00250) to appropriate groups, to verify legibility of documents and drawings at each phase of the design and modification process. Subsequent drawings were reviewed by the NRC inspector to verify the adequacy of the licensee's program.

2.1.5 (Closed) Violation (313/8803-02; 368/8803-02): The violation concerned inadequate measures for identification and control of material parts or components, which do not conform to requirements, in order to prevent items being inadvertently used or installed.

The NRC inspector verified that the corrective actions were conducted as proposed in the licensee's response dated June 3, 1988. The subassembly that was not to be used was tagged with a hold tag and turned over to the control of Material Management, in accordance with the procedure for control of material, parts, and components. Plant Procedure 60304, Rev. 0, "Control of Prefabricated Parts and Subassemblies," was created to incorporate the controls established by Standing Order 1000.26A, "Segregation Controls for Prefabricated Parts and Subassemblies."

2.1.6 (Closed) Violation (368/8804-01): The violation concerned the failure to follow procedural requirements for documenting calibration activities. This violation involved the licensee's failure to properly date and initial records for Data Package No. ANO-410-001-4 for Ultrasonic Examination 01-017.

During the followup inspection, the NRC inspector verified that the licensee had taken the appropriate corrective actions. Examination records had been corrected and reviews of other records had been accomplished.

2.1.7 (Closed) Violation (313/8804-04): The violation concerned the failure to use the Licensing Commitment Tracking System (COMTRAC) for possible nuclear safety concerns.

During the followup inspection, the NRC inspector reviewed the licensee manual tracking system, in place at the time of the violation, and verified that 10 CFR Part 21 items had been entered into this system and processed in a timely manner. Furthermore, the licensee has implemented Station Administrative Procedure 1000.104, "Condition Reporting and Corrective Actions," dated May 26, 1988, which requires reporting of nonconformances. Procedure 304, has been deleted and the requirements combined into the condition reporting system procedure and the operations assessment program, Station Administrative Procedure 1000.29, dated April 5, 1988. These two procedures provide instructions and guidance for reporting, tracking, prioritizing and reviewing both in-house and industry-related concerns.

2.2 Unresolved Items

2.2.1 (Closed) Unresolved item (313/8804-05; 368/8804-06): The unresolved item concerned the adequacy of licensee's administrative procedures for reporting 10 CFR Part 21 items.

During the followup inspection, the NRC inspector verified the licensee's implementation of Station Administrative Procedure 1000.104, Rev. 1, "Condition Reporting and Corrective Actions," dated May 28, 1988. The inspector verified that this procedure included provisions for the control and reporting of potential 10 CFR Part 21 items.

2.2.2 (Closed) Unresolved item (368/8804-03): The unresolved item concerned the adequacy of piping stress calculations associated with piping supports for the service water system. This item involved the adequacy of the licensee's engineering judgement relative to the operability status of service water system support hangers.

During the followup inspection, the NRC inspector reviewed the licensee's revision of Calculation No. 88E00011-01 and DCP No. 85-2174 along with related licensee correspondence with the constructor. The operability review analysis used by the licensee appeared to be adequate.

2.3 Open Items

2.3.1 (Closed) Open item (313/8732-01): The open item concerned the followup actions on RAC-1-84-254.

During the followup inspection, the NRC inspector verified that the licensee had properly reviewed the corrective actions taken on RAC-1-84-254 and found those actions adequate. Furthermore, the licensee had incorporated provisions for determining the significance of reported conditions and tracking corrective actions to verify adequacy and completeness. These provisions have been incorporated into Station Administrative Procedure 1000.104, Rev. 1, "Condition Reporting and Corrective Actions," dated May 29, 1988.

2.3.2 (Closed) Open item (313/8734-01; 368/8734-01): The open item concerned the omission of a Quality Action Request (QAR) from the QA tracking system.

The NRC inspector verified the corrective actions that were taken by the licensee. The licensee issued an action request to check if any other QAR's had been omitted from the QA tracking system. The review showed that QAR-312 had been the only QAR to have been omitted. This was termed to have been accidentally done when the QA tracking system was being changed over from a manual system to a computerized system.

2.3.3 (Closed) Open item (313/8804-01; 368/8804-01): This open item concerned the examination of reactor vessel (RV) belt line weld repaired areas. This open item involved the licensee's determination as to whether repairs were made to the reactor vessel belt line region and the incorporation of required examinations into the ISI program plan.

During the followup inspection, the NRC inspector verified that the licensee had identified the repair weld accomplished on the Unit 1 reactor vessel belt line region. This repair weld was designated under Figure B1.1.4 and inspected in December 1982. This repair weld had been incorporated into the ISI program plan for the second 10-year period and designated as Exam No. 01-010A, Item Cat. No. B1.50.1. No RV belt line area repair welds for Unit 2 were accomplished.

that if unidentified RCS leakage exceeds 1 gpm, the reactor shall be shut down within 24 hours. The NRC inspector observed the licensee's actions following entrance into the TS action statement and found those actions timely and adequate. However, upon review of the control room log, the inspector noted an area of concern related to the licensee's response to the RCS leakage event. ANO Unit 1 has established operating procedures for leak detection to include large and small loss of coolant accidents in compliance with TS 6.8.1 and Regulatory Guide 1.33, Appendix A, Rev. 2, dated February 1978. Operations Procedure 1103.13, Rev. 8, "RCS Leak Detection," dated April 26, 1988, states, in part, that, "if the RCS unidentified leak rate increases by greater than 0.2 gpm or shows an increasing trend, then perform a backup RCS leak rate determination and attempt to locate and quantify the leakage per Section 7.3." During the period of August 21-25, 1988, RCS unidentified leakage increased from .181 gpm to 3.09 gpm. Daily RCS unidentified leakage increases averaged .181 gpm with a greater than 0.2 gpm variance occurring between August 22-23, 1988. On August 25, 1988, the RCS unidentified leakage step increased from .905 gpm to 3.09 gpm, which exceeded the TS limit of 1 gpm. The licensee's failure to promptly recognize and respond to an upwardly trending RCS unidentified leak rate until exceeding the TS limit on August 25, 1988, represents a departure from Operations Procedure 1103.13, Revision 8. As such, the failure to implement corrective actions to identify, quantify, and isolate RCS unidentified leakage in a timely manner is an apparent violation of Criterion XVI of Appendix B to 10 CFR Part 50 and Operations Procedure 1103.13 (50-313/8828-01).

The licensee's followup actions to identify and isolate the unidentified leakage after entering TS 3.1.6 action statement appeared adequate. Key operations personnel performed walkdown inspections, both inside and outside the containment, trended key tank levels, verified instrumentation indications, and systematically isolated leaking valves. Operations personnel identified a letdown relief valve, PSV-1236, as a major contributor to the leakage. When PSV-1236 was isolated by gagging, the unidentified leakage reduced to .905 gpm. The licensee exited TS 3.1.6 at 11:30 p.m., August 25, 1988. After various valve realignments and ungagging of PSV-1236, the licensee found the RCS unidentified leak rate to be 1.495 gpm. As such, TS 3.1.6 was reentered at 8:30 p.m. on August 26, 1988. Subsequent licensee review and evaluation of RCS leakage problems (controlled and unidentified) resulted in Unit 1 shutdown on August 27, 1988.

6.0.2 RCS Leak Rate Determination Procedure

During the onsite followup to the RCS leakage event during August 22-26, 1988, the NRC inspector reviewed ANO's Unit 1 Operations Procedure 1103.13 [illegible] "RCS Leak Rate Determination," for adequacy. The NRC inspector identified two areas of concern, which were later discussed with t[illegible]ing the exit interview.

The NRC inspector found the procedures to be adequate.

No violations or deviations were identified in the review of this program area.

5.0 Monthly Surveillance Test Witnessing (61726)

This portion of the inspection involved the observation of monthly surveillance tests. The following surveillance tests and the applicable procedures were observed and reviewed.

- 1304.18, Rev. 6, "EFIC Channel 'D' Monthly Test"
- 2104.02, Rev. 14, "Chemical and Volume Control"

The purpose of the above surveillance tests were to verify the functionality of the EFIC system, Channel D, and to verify the chemical and volume control system charging pump operational reference data. Within the scope of the performed tests, the NRC inspector verified that the systems/components satisfied the stated acceptance criteria.

No violations or deviations were identified in the review of this program area.

6.0 Onsite Followup to Operational Events and Safety Verification (93702 and 71704)

6.0.1 Reactor Cooling System (RCS) Leakage Event

This portion of the inspection involved the observation of control room operators' actions, in-plant performance of daily evolutions, and followup actions related to the identification, quantification, and isolation of RCS unidentified leakage in Unit 1. During the period of August 22-26, 1988, it was noted that in Unit 1 operations, the primary effort of key operations personnel was directed toward stabilizing balance of plant (BOP) steam header pressure oscillations. Reactor operators found intermittent steam pressure oscillations controllable when the turbine was taken into manual control. The control room operators and the I&C maintenance manager attributed the oscillations to BOP systems' anomalies, which typically occur at the 65-70 percent power range of operation. Other speculation by the operators included possible errors in the integrated control system (ICS).

Plant evolutions conducted during August 22-26, 1988, for Unit 1, included required monthly surveillance tests, trending controlled RCS leakage from Reactor Coolant Pumps "B" and "C" seals, flushing the quench tank to the liquid radwaste receiver tanks via the vacuum degassifier, and LiOH additions to the RCS.

On August 25, 1988, the NRC inspector noted that Unit 1 entered a 24-hour action statement associated with TS 3.1.6. TS 3.1.6 requires

3.0 10 CFR Part 21 Items

3.0.1 (Closed) 10 CFR Part 21 Report (87-038): This report referred to a relay from the Square D Company, Class 8501 Type KPD-13, which failed to drop out when deenergized.

ANO personnel performed a Plant Impact Evaluation (PIE #87-0050-B, dated August 24, 1987). A SIMS component database search revealed that no Square D DC relays, of the type and model described, were installed at the ANO site. A review of the ANO-1 and ANO-2 emergency diesel generator monitoring and control circuits (where the failure described in the Part 21 report occurred), revealed no constantly energized DC relays. In addition, relays which are constantly energized, will be monitored and/or periodically replaced. Those relays that are required to be functional, in the event of an Engineered Safeguards actuation, are exercised every 18 months.

4.0 Containment Local Leak Rate Testing (61720)

The NRC inspector reviewed available local leak rate test (LLRT) procedures to determine the following:

a) All applicable containment penetration barriers (CPB) and containment isolation valves (CIV) are subject to local leak rate testing.

b) The LLRTs are performed at CILRT peak pressure except where reduced pressure tests have received prior NRR approval in the Technical Specifications (TS).

c) The LLRT program utilizes approved methods for testing CPBs and CIVs.

d) The penetration leakage rates are determined using the maximum pathway leakage.

e) The criteria are stated for the required response to leaks for LLRT and combined leakage rate failure.

f) The criteria are stated for the response to the leakage rate failure of components specifically cited in the TS.

The following are the procedures that were reviewed:

Procedure No.	Title
1304.023, Rev. 0	Local Leak Rate Testing of Electrical Penetrations
1304.020, Rev. 0	Reactor Building Access and Ventilation Leak Rate Testing

The first area of concern related to the frequency of accomplishing RCS leak rate determinations. Procedure 1103.13, Rev. 8, requires that RCS leak rate determination be accomplished on a 24-hour basis with a backup determination performed when previous results indicate a step change or increasing trend in unidentified RCS leakage. In subsequent review of NUREG-0986, "RCSLK8: Reactor Coolant System Leak Rate Determination for PWRs," the NRC inspector noted that it is recommended that in order to achieve accurate unidentified RCS leak rate determinations, the duration of the leak rate test must be 4 hours or more. This statement implies that leak rate determination should not be performed at a frequency less than every 4 hours. No further guidance could be provided at the time, on increasing the frequency of RCS leak rate determination. The licensee stated that it would give consideration to the guidance provided by the NRC inspector.

The second area of concern involved the accuracy of RCS leak rate determinations. Presently, the ANO Unit 1 procedure requires the reactor operator to take data points off the plant process computer and manually transcribe the data to a procedure form. The leak rate results are then determined through a manual calculation. ANO has no other independent means of accurately quantifying the RCS leak rate. The NRC inspector has noted through review of leakage reduction programs at other facilities, that RCS leak rate determinations may be accomplished both by means of a manual calculation or via a computer software program. The incorporation of a RCS leak rate software program similar to that provided in NUREG-0986 provides an accurate and reliable alternative means of independently verifying the RCS leak rate determination.

ANO's presently established procedures appear to be adequate and in compliance with regulatory requirements. A revision to the licensee's leakage reduction program based upon the above discussion is a matter for the licensee's consideration.

7.0 Exit Interview

The NRC inspectors met with licensee representatives, denoted in paragraph 1, on August 26, 1988, and summarized the scope and findings of the inspection. The licensee did not identify as proprietary any of the material provided to, or reviewed by, the inspectors during the inspection.