

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

IE Inspection Report No. 50-313/76-02

Docket No. 50-313

Licensee: Arkansas Power & Light Company  
Sixth & Pine Streets  
Pine Bluff, Arkansas 71601

License No. DPR-51

Category C

Facility: Arkansas Nuclear One, Unit 1

Location: Russellville, Arkansas

Type of License: B&W, PWR, 2568 Mwt

Type of Inspection: Routine, Unannounced

Dates of Inspection: February 10-12, 1976

Dates of Previous Inspection: January 6-8, 1976

Principal Inspector: *D. G. Anderson*  
D. G. Anderson, Reactor Inspector

*2/19/76*  
Date

Other Accompanying Personnel: None

Reviewed By: *A. S. Madsen*  
G. L. Madsen, Chief, Reactor Operations and  
Nuclear Support Branch

*2/19/76*  
Date

8004160389

SUMMARY OF FINDINGS

A. Enforcement Action

1. Items of Noncompliance

None identified by the inspector.

2. Deviations

None identified by the inspector.

B. Licensee Action on Previously Identified Enforcement Items

The licensee has amended procedures related to housekeeping which include a schedule of monthly inspections. Monthly inspections are being conducted and corrective action is documented. (DETAILS, paragraph 6)

This item is closed.

C. Design Changes

DCR-410 provides for the installation of an additional reed relay in series with the original reed relays which provide gating power to the SCR's in the CRDM gate drive circuit. (DETAILS, paragraph 4)

D. Unusual Occurrence

Not inspected.

E. Other Significant Findings

1. Current Findings

a. Acceptable Areas

(1) Welding and Nondestructive Examination. (DETAILS, paragraph 9)

b. Unresolved Items

(1) 7602-01

The reason for CRDM binding is not known. (DETAILS, paragraph 4)

(2) 7602-02

Mechanism for reporting changes in key plant positions noted on Figure 6.2-1 of the Technical Specifications. (DETAILS, paragraph 7)

(continued)

2. Status of Previously Unresolved Items

a. Acceptable Areas

7508-06 Steam Line Break Instrumentation and Control  
(SLBIC)

This item is closed. (DETAILS, paragraph 5)

F. Management Exit Meeting

At the conclusion of the inspection on February 12, 1976, the findings of the inspection were discussed with Mr. J. W. Anderson, Jr., Plant Superintendent (ANO-1) and the following members of his staff:

G. H. Miller  
J. Robertson  
C. A. Halbert  
T. Martin  
P. Jones  
L. Alexander, Jr.

The inspector addressed the following items during the course of this meeting:

- (1) Concern related to the binding that has been experienced with operation of the CRDM's. (DETAILS, paragraph 4)
- (2) Resolution of reporting mechanism for changes in key plant personnel positions noted on Figure 6.2-1 of the Technical Specifications. (DETAILS, paragraph 7)

(continued)

DETAILS

1. Persons Contacted

Arkansas Power & Light Company (AP&L)

J. W. Anderson, Jr., Plant Superintendent  
G. H. Miller, Assistant Plant Superintendent  
B. G. Parker, Shift Supervisor  
J. Robertson, Assistant Supervisor of Plant Operations  
P. Jones, Instrument and Control Supervisor  
J. Crowe, Store Room Supervisor  
L. Alexander, Quality Control Inspector  
J. L. Orlicek, Quality Control Engineer  
R. Simmons, Plant Operator  
L. Long, Assistant Plant Operator  
C. L. Bean, QA Inspector  
L. W. Humphrey, QA Engineer  
T. Martin, Maintenance Supervisor  
C. A. Halbert, Technical Support Engineer  
M. Bishop, Records Supervisor  
R. T. Elder, Assistant Instrumentation Supervisor

2. Plant Status

During the course of the inspection, the plant operated at 99% FP. Thermal output was noted to be 2540 Mw(t), Gross Generation was 860 Mw(e), and Net Generation was 830 Mw(e). The plant has operated continuously on this basis since January 19, 1976.

3. Purpose of Inspection

The licensee representative was advised at the entrance meeting on 2/10/76 that the following items would be reviewed during this inspection:

- a. Circumstances of the recent ratchet trips.
- b. AO 75/10, AO 75/11, AO 75/12, and AO 76-01.
- c. Action on unresolved items.
- d. Action on previously noted items of noncompliance.

(continued)

4. Ratchet Trip Summary

The inspector reviewed log books, drawings, work plans, job orders, computer output, brush recorder charts, a design change request (DCR-410), and conducted discussions with licensee representatives to evaluate action taken to correct the relay failures which resulted in Group 6 CRDM ratchet trips on December 20, 1975, December 21, 1975 and January 5, 1976.

a. General

The ratchet trips of December 20, 1975 and December 21, 1975 were reported as per the requirements of TS 6.12.3.1 as AO 75-10. The ratchet trip of January 5, 1976 was reported as per the requirements of TS 6.12.3.1 as AO 76-01.

b. Chronology

After the first ratchet trip of December 20, 1975, the operator on duty thought that he had experienced a rod run back and his immediate action of relatching the Group 6 control rod bank allowed him to return the plant to power without tripping the other control Groups. After the ratchet trip of December 21, 1975, none of the Group 6 rods would latch, however, after partial cool down of the plant all Group 6 rods were withdrawn except one. The licensee then made the decision to completely cool down and inspect the CRDM of the single Group 6 rod. The lead screws for all eight Group 6 CRDM's were repaired for ratchet damage. All maintenance was completed on December 30, 1975 and the plant returned to operation. On January 5, 1976, after the third ratchet trip, and subsequent cool down of the plant, a computer analysis of the stator coil firing sequence resulted in pinpointing the problem to failure of reed relays in the gate drive assembly. The defective relays were replaced and additional redundant relays were added in series prior to return to power on January 18, 1976. During this shutdown, all CRDM's of Group 6 were removed, disassembled, deburred, and cleaned. One CRDM from Group 7 was also inspected and resulted in no indication of ratchet trip damage.

c. Possible Generic Implications

During the shutdown of January 5, 1976 to January 18, 1976 it was found that reed relays 1/ which supply gating power to the 8CR's had failed with the contacts in the closed position.

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1/ Reed Relay K-1 Specifications: Struthers-Dunn (SP/ST) 24VDC MRR1A.  
Diamond Power Number 956410-0001

Babcock & Wilcox in its letter dated January 14, 1976 advised the licensee to replace all relays which could not pass the following tests:

- (1) Coil resistance (4600 ohms)
- (2) Contact resistance (200 milli ohms)
- (3) Pull-in voltage (8-19.2 volts)
- (4) Drop out voltage (2 volts minimum)

AP&L also added a redundant relay in series with each of the existing relays as part of the corrective action.

The licensee was advised that this item will remain open pending the results of vendor appraisal of CRDM binding which has been experienced during these ratchet trip events. The inspector will also look more closely during subsequent inspections at records and procedures related to licensee actions during the ratchet trip shutdowns.

This item remains open pending further evaluation.

5. Steam Line Break Instrumentation and Control (SLBIC)

IE Report 75-08/06 refers to surveillance tests performed quarterly by the licensee. A procedural revision has been written (OP 1105.05 Revision 2) for the use of the Travel Limit Stop Pins during surveillance tests. This procedure was reviewed and approved by the Plant Safety Committee (12/2/75) and the Safety Review Committee (12/10/75) and has been implemented during the last quarterly surveillance tests.

This item is closed.

6. Housekeeping Procedures

IE Report 75-08/09 related to a deficiency noted with respect to failure to follow housekeeping procedures, i.e., failure to schedule and conduct housekeeping inspections. Revision 1, OP 1406.01 now requires monthly inspections for housekeeping and maintenance of records. The inspector noted that monthly inspections are being conducted and recorded. Followup and corrective action is also being documented.

This item is considered closed.

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7. Administrative Changes

On February 11, 1976 Mr. J. L. Orlicek, QC Engineer, terminated and Mr. L. Alexander, Jr. assumed his position. Figure 6.2-1 of the ANO-1 Technical Specifications requires that the NRC be notified of personnel changes to certain key positions on the organization chart. Prior to Amendment No. 9 to the Technical Specifications, these changes were required to be reported by TS 6.12.2.3(a)(7) in the Semiannual Report. The inspector could find no requirement for reporting these changes in Amendment No. 9 to the Technical Specifications.

This item will remain open pending further resolution.

8. Licensee Event Reports

The review of AO #75-10, 75-11, 75-12 and 76-01 could not be completed since records of the Safety Review Committee meeting minutes for January and February 1976 were not available at the plant for evaluation.

This item remains open pending availability of these records at the plant.

9. Welding and Nondestructive Examination

The inspector reviewed welding and nondestructive examination procedures, activities, and operator performance qualifications to verify that:

- a. Instruction manuals contain and reference design basis technical requirements including applicable regulatory requirements, component and material identification requirements, drawings, specifications, codes and industrial standards, test and inspection requirements, special process instructions, and training and qualification programs.
- b. The performance qualifications of one Level III Examiner and one Pipefitter met the applicable requirements of ANSI N45.2.6 and Regulatory Guide 1.31.
- c. Several major maintenance activities performed during the last year which required welding and subsequent NDE were performed by qualified welders and NDE Technicians.

(continued)

d. Performance qualification programs are established and include the following:

- (1) a record of the procedures, including the essential variables, under which welders are examined;
- (2) the assignment of an identifying number, letter or symbol to each welder which shall be used to identify the work of that welder;
- (3) the method whereby welding procedures are reviewed, qualified and approved are delineated and followed;
- (4) retest requirements are prescribed and followed;
- (5) appropriate records are maintained and documented to:
  - (a) determine when a welder needs to be retrained or recertified based on a change in essential variables and time duration since the welder last used the process;
  - (b) determine which welders are currently qualified to perform a given procedure;

The inspector had no questions on this item.