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

REGION IV

Report No. 50-313/78-08

Docket No. 50-313 License No. DPR-51

Licensee: Arkansas Power and Light Company
Post Office Box 551
Little Rock, Arkansas 72203

Facility Name: Arkansas Nuclear One, Unit No. 1

Inspection at: ANO No. 1 Site, Russellville, Arkansas

Inspection conducted: March 7-13, 1978

Inspectors: A. B. Rosenberg, Reactor Inspector — Date: 3-27-78
Engineering Support Section

Other Accompanying Personnel: R. E. Hall, Chief, Engineering Support Section

Reviewed: for T. F. Westerman, Reactor Inspector, Reactor — Date: 3/27/78
Operations and Nuclear Support Branch

Approved: W. A. Crossman, Acting Chief, Engineering — Date: 03/28/78
Support Section

Inspection Summary:

Inspection on March 7-13, 1978 (Report No. 50-313/78-08)
Areas Inspected: Routine, announced inspection involving: (1) review of the Containment Integrated Leak Rate Test (CILRT) Procedure; (2) witnessing of the CILRT; and (3) review of a previously identified unresolved item. This inspection involved 65 hours by one inspector.
Results: Of the three areas inspected, no items of noncompliance were found in two areas; and two apparent items of noncompliance were found in one area (infraction - failure to follow procedure for CILRT; infraction - failure to adequately execute QC surveillance of CILRT).

DETAILS

1. Persons Contacted

Arkansas Power and Light Company (AP&L)

*L. Alexander, Quality Control Engineer
*C. H. Halbert, Technical Support Engineer
*G. H. Miller, Assistant Plant Manager

Bechtel Corporation

G. V. Cranston, Engineering Specialist

The inspector also interviewed other licensee and contractor personnel including members of the AP&L and Bechtel engineering and QC staffs.

*Denotes those attending the exit interview.

2. Follow Up on Previous Inspection Findings

(Open) Unresolved Item (77-03): The licensee was previously unable to provide documentation to show the acceptability of local leak rate testing of isolation valves from the reverse direction of accident pressure. During this inspection, the inspector reviewed memoranda between AP&L engineering and the site (NDC-6522, -6760, -6942, -6945, JWA-4304, -4674). The licensee identified twenty isolation valves of concern. Of the twenty valves identified, two required special valve lineups to test, thirteen required system modifications and have been assigned DCRs, and five are still being reviewed. This item will remain open pending completion and NRC review of the modifications.

3. Containment Integrated Leak Rate Test (CILRT) Procedure Review

The inspector reviewed procedure No. 1304.31, "Integrated Leak Rate Test Procedure," Revision 0. The review included the following areas:

Management approval and review,

Test objectives and acceptance criteria,

Personnel responsibilities,

Provisions for a test log,

Test prerequisites,

Valve line-ups, venting and draining,

Instrument calibration and operation requirements,

Requirement for local leak surveys,

Fan and cooler requirements,

Test pressure requirements,

Stabilization and test duration requirements,

Data collection requirements,

Verification test requirements, and

Provisions to return equipment and systems to their pretest positions.

The inspector's initial review of the procedure, which the Plant Safety Committee had reviewed and approved for use, identified several areas of concern. These areas included: the wrong containment volume, removing of pressurized gas sources from the containment, and several instances of artificial leakage barriers created by the valve lineups. The licensee was revising the procedure during the inspector's review of Revision 0. All identified areas of concern were incorporated in Revision 1 to Procedure 1304.31.

Valve lineups for forty-three of fifty-eight containment penetrations were reviewed against piping schematics by the inspector. No artificial leakage barriers were identified in Revision 1. All areas reviewed in Revision 1 were found to be in accordance with Appendix J to 10 CFR 50 and ANO Unit No. 1 Technical Specifications.

No items of noncompliance were identified during this portion of the inspection.

4. Witnessing of CILRT

a. Test Chronology

3-10-78	10:30 a.m.	Start Pressurizing Containment
	7:00 p.m.	Hold Point at 14 psig Containment Entry and Local Leak Survey
	11:00 p.m.	Resume Pressurization

3-11-78	9:17 a.m.	Pressurization Stopped at Test Pressure (30.9 psig) Start of Stabilization Period
	1:15 p.m.	Stabilization Complete
	2:00 p.m.	Start Half Pressure CILRT
3-12-78	2:00 p.m.	Half Pressure CILRT Complete
	2:45 p.m.	Start Verification Test
	8:45 p.m.	Complete Verification Test

b. Preparation and Pressurization

The inspector observed portions of the test preparations including alignment of valves, CILRT instrumentation functional check, and the general inspection of the containment interior. While inspecting the inside of the containment, the inspector observed and identified to the licensee that pressurized fire extinguishers in the containment had not been specifically listed in the procedure as compressed gas sources. The licensee subsequently informed the inspector that the fire extinguishers would be removed from the containment and placed near the personnel lock.

Pressurization of the containment was started at 10:30 a.m., March 10. The hourly water and oil check of the pressurizing air was observed twice. All sample cloths were examined during the pressurization period, with no oil or excessive moisture noticed by the IE inspector.

The pressurization was stopped at 13.7 psig (14 psig nominal) for an interior containment inspection and leak survey, as required by Procedure 1304.31, Section IV, Phase 3. During this hold point, Phase 3, the inspector observed at 9:00 p.m. on March 10, 1978, that one sign off in Phase 1 and eight sign offs in Phase 2 had not been completed even though the test was in Phase 3. The absence of these sign offs was not in accordance with the procedure which in Section 3, paragraph B, required that each phase of the test be completed before a new phase is initiated.

Further review of the absent sign offs revealed that in Phase 1, "Test Preparation," line B.12, "System line-ups completed is required per Appendix B" was not signed. Review of Appendix B of the procedure revealed that the valve line-ups had not been completed. A line item on page B-9 requiring that "manways, handholes, etc. which could allow communication between the containment atmosphere and the secondary side of the steam generators are shut and closures properly torqued," was not initialed or dated. Review of the chronological log indicated that a containment entry was made during pressurization to tighten handholes and/or manways on the secondary side of one

of the steam generators which was being pressurized due to the containment pressurization. The review of Appendix B to the procedure also revealed individual valve lineups on 20 of 40 pages of the valve lineup, were initialed, but the dates were not completed.

There was no indication that the steps had not been completed for the eight line items in Section VI, Phase 2, "Pressurization to 14 psig," which were not signed off prior to initiating Phase 3.

Subsequent to identification of the problem by the inspector, the licensee's test director completed the missing signatures and dates. Permanent Change No. 2 (PC-2) for Procedure 1304.31 was issued on March 11, 1978, which revised line item B.12 in Phase 1 to read, "System line-ups completed as necessary to begin pressurizing reactor building."

The above failure to follow the approved procedure is considered an item of noncompliance.

Pressurization was continued to 30.9 psig without further complications.

c. Half Pressure CILRT

Test pressure was reached at 9:17 a.m., March 11. The inspector verified the valve line-ups for six mechanical penetrations, (P-7, 31, 32, 40, 41 and 47) outside the containment and found them to be in accordance with Appendix B of the procedure. The inspector also witnessed a portion of the exterior survey for leaks of containment penetrations which included five electrical penetrations. No leaks were detected.

The containment stabilization period ended at 1:15 p.m. Review of the containment temperature data indicated an hourly temperature fluctuation of 0.12 degrees per hour which was within the acceptable deviation of 0.5 degrees Fahrenheit per hour.

The half pressure CILRT was started at 2:00 p.m. March 11. The inspector periodically observed data collection. Data were automatically printed out for the temperatures, dew points and pressure at 15 minute intervals. The data were manually fed into the Bechtel computer through a remote terminal, then read back to verify that the computer had accepted the proper data. Also observed were the evaluation of individual temperature and dew point readings.

After the first eight hours of the test, the licensee elected to continue the test for a total of 24 hours because the 95% upper confidence interval was not sufficiently low. At the conclusion of the twenty-four hour test, the licensee's leakage calculation results and the NRC verification results were as follows:

	Leakage Rate*	95% Confidence Interval	Acceptance Criteria (75% Lt)
Licensee	0.009%	±0.005	0.054%
NRC	0.0088%	±0.0048	0.054%

*Calculations by Mass Plot method.

The plant heating system (penetrations P-42 & -48) was not lined up, vented or drained for the test; however, it was the licensee's intention to modify the system as a result of the unresolved item discussed in paragraph 2 above. These penetrations will be locally leak rate tested after modification. The results of these local tests will be added to the CILRT results to determine the actual containment leakage as permitted by the licensee's technical specifications.

Calibration data for the instruments (sensors, transmitters, and recorders) used were found to be current and in accordance with Procedure No. 1304.31.

No items of noncompliance were identified during this portion of the inspection.

d. CILRT Controlled Leakage Test

To verify the acceptability and accuracy of the instrumentation and calculations, the licensee imposed a controlled leakage of 2.54 SCFM. The measured and calculated leak rates for the verification test were within the 25% Lt criteria of 10 CFR 50, Appendix J. The inspector's calculations correlated closely with the licensee's.

No items of noncompliance were identified during this portion of the inspection.

e. Quality Control Activities During CILRT

The NRC inspector observed Quality Control (QC) surveillance of the CILRT and found that QC had not adequately executed the surveillance activities. Through interviews with the QC Engineer, the inspector determined that QC personnel had neither reviewed nor read procedure No. 1304.31 prior to the start of the test. It was also found that a specific surveillance plan was not

prepared for the test activity. QC personnel were not observed conducting surveillance during several key test evolutions, specifically: valve lineups; test pressure exterior leakage survey; and start of the verification test.

Although ten and a half hours had elapsed from the end of Phase 1, two hours had elapsed from the end of Phase 2, and Phase 3 was in progress, QC failed to identify the items in paragraph 4.b. above.

It is the inspector's conclusion that surveillance of key test evolutions was not performed because review of the procedure and planning of the QC surveillance activities were not performed. The inspector pointed out that planning is an important foundation of any inspection or surveillance activity. K. E. Bromenschenkel of Carolina Power and Light Company in the paper "How to Manage Operations to Assure Quality--Refueling,"1/ states that, "QA personnel work directly with the various work groups . . . by reviewing work procedures or instructions prior to the work beginning . . . ."

Failure of ANO Unit No. 2 QC to adequately execute surveillance of the CILRT, as required by AP&L Topical Report APL-TOP-1A, is in noncompliance with the requirements of Criterion X of Appendix B to 10 CFR 50.

5. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. No new unresolved items resulted from this inspection.

6. Exit Interview

An exit interview was conducted on March 13, 1978, following completion of the inspection. During this interview the inspector discussed the scope of the inspection and the resultant findings, including the apparent items of noncompliance reported in paragraphs 4.b. and 4.e. above.

1/ASQC Fourth Annual National Conference on Nuclear Power, October, 1977.