

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

REGION IV

Report No. 50-313/77-18; 50-368/77-23

Docket No. 50-313
50-368

License No. DPR-51
Construction Permit No. CPPR-89

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

Facility Name: Arkansas Nuclear One, Units 1 & 2

Inspection at: ANO, Units 1 & 2 Site, Russellville, Arkansas

Inspection conducted: October 17-21 and 23-25, 1977

Inspector:

A. B. Rosenberg
A. B. Rosenberg, Reactor Inspector, Engineering
Support Section

11/8/77
Date

Other
Accompanying
Personnel:

C. L. Heck, Engineering Aide, Engineering Support Section

Reviewed:

T. F. Westerman
T. F. Westerman, Reactor Inspector

11/5/77
Date

J. E. Gagliardo
J. E. Gagliardo, Reactor Inspector

11/3/77
Date

Approved:

R. E. Hall
R. E. Hall, Chief, Engineering Support Section

11/8/77
Date

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Inspection Summary:

Inspection on October 17-21 and 23-25, 1977 (Report No. 50-313/77-18;
50-368/77-23)

Areas Inspected: Routine, announced inspection involving: (1) witnessing of the Unit No. 2 Containment Integrated Leak Rate Test; (2) review of procedures; (3) review of previously identified unresolved items regarding Unit No. 1; and (4) review of Licensee Event Reports. The inspection involved sixty-eight (68) inspector-hours on site by one NRC inspector.

Results: Of the four areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Arkansas Power and Light Company

*L. Alexander, Quality Control Engineer
+J. R. Anderson, Assistant Production Startup Supervisor
*J. W. Anderson, Superintendent of Power Plant
+D. N. Bennett, Production Startup Supervisor
*R. T. Elder, Assistant Instrument and Control Supervisor
+L. W. Humphrey, Quality Assurance Supervisor
V. A. Kinsey, Assistant Engineer
J. C. Longinotti, Startup Engineer
G. H. Miller, Assistant Plant Superintendent
E. Quattlebaum, Quality Assurance Inspector
R. L. Turner, Assistant Instrument and Control Supervisor

Bechtel Corporation

J. J. Barron, Startup Engineer
G. V. Cranston, Engineering Specialist
R. C. Dundas, Engineering Specialist
D. A. Garner, Startup Engineer
R. E. Riggs, Startup Engineer

*Indicates those attending exit interview for Unit No. 1 on October 21, 1977.

+Indicates those attending exit interview for Unit No. 2 on October 25, 1977.

2. Follow Up on Previous Inspection Findings - Unit No. 1

(Closed) Unresolved Item (77-03): The licensee was unable to measure the local leakage rate at penetration Nos. 51, V-1 and V-2 (type C tests) due to limitations of the test equipment. Evaluation by the licensee determined that other equipment was available on site which was capable of measuring air flows up to 50,000 cubic centimeters per minute (1.4833 ft³/min). Fifty thousand cubic centimeters per minute is greater than the allowable leakage for all type "B" and "C" tests specified in Section 4.4.1.2.3 of the station Technical Specifications. The licensee had reported the measured leakage rate in LER No. 50-313/77-15 (see paragraph 5).

The local leak test reports for the affected penetrations have been amended to quantify the as found leakage as greater than 50,000 cubic centimeters per minute. The affected valves have been repaired and/or adjusted and total leakage brought into specification limits. This matter is considered closed.

(Open) Unresolved Item (77-03): The licensee was 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 AP&L memoranda dated September 28, 1977 (NDC-6484) and October 3, 1977 (JWA-4209). The first memorandum from AP&L engineering identified the intent to meet the requirements of Section XI, ASME B&PV Code. The second memo from ANO, Unit 1 concurred with the ASME requirements and requested a timely analysis. This matter will remain open pending completion of NRC review of the licensee's analysis.

3. Containment Integrated Leak Rate Test (CILRT) Procedure Review - Unit No. 2

The inspector reviewed procedure No. 2.059.03, "Primary Reactor Containment Integrated Leakage Rate Test." 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.

All areas reviewed were found to be in accordance with requirements of Appendix J to 10 CFR 50 and the Unit No. 2 FSAR.

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

4. Witnessing of CILRT - Unit No. 2

a. Initial Pressurization and Leak Survey

The inspector witnessed portions of the initial pressurization and leak survey. The inspector observed the leak survey for approximately 27 of the 38 electrical penetrations being used and approximately 35 of the 53 mechanical penetrations being used. The electrical penetrations are the continuously pressurized type, with individual pressure gages for each penetration. The mechanical penetrations were checked with a liquid bubbling solution. No leaks were identified by the licensee at the 14 psig plateau.

During the initial half pressure test at 27 psig, the calculated leakage was higher than the expected allowable leakage. A leak survey revealed pressurization of the main steam lines. Evaluation by the licensee indicated that a feedwater check valve with a reverse seating bonnet was leaking. The containment was depressurized to 14 psig and a temporary repair made to the check valve to stop the leakage. During accident conditions, the secondary system is postulated to be at a much higher pressure than the containment and out leakage would not occur.

b. Full Pressure CILRT

After stabilization was attained, the inspector witnessed approximately 70% of the activity during the first full pressure test between 6:00 a.m. and 3:00 p.m., October 24, 1977. Activities observed were those relating to the areas identified in paragraph 3 above.

Fifteen mechanical penetrations were randomly selected to be checked for proper valve line-up and venting. All valve positions and vents outside the containment were visually checked against the valve line-ups in procedure No. 2.059.03 and Section 6.2 of the FSAR. Valve positions and vents inside the containment were checked against the marked up P&IDs used for the test, procedure No. 2.059.03 and Section 6.2 of the FSAR.

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 put into the Bechtel computer thru a remote terminal. The data were then read back to verify the computer had accepted the proper data. Also observed were the evaluation of individual temperature and dew point readings. One dew cell out of six was eliminated due to instability. The volume fractions were redistributed to compensate for the reduced number of dew cells.

Calibration data for the instruments (sensors, transmitters, and recorders) used were found to be current and in accordance with procedure No. 2.059.03.

c. CILRT - Controlled Leakage Test

To verify the acceptability and accuracy of instrumentation and calculations, the licensee imposed a controlled leakage of 0.1% per day (5.85 scfm) on the containment. The imposed leakage was measured with a Volumetrics mass flow device Model No. 14324, Serial No. 137 and calibrated June 14, 1977. The calculated leak rate for the verification test was approximately 45% of La (.1%) above the expected .119%. Due to the consistency of test data, the licensee suspected the flow meter as the causal factor for verification test being out of the plus or minus 25% of La limits imposed by Appendix J to 10 CFR 50.

The licensee then placed a Brooks rotameter, Model No. 1110-08K2B1A, Serial No. 7702H02130, calibrated March 8, 1977, in series with and on the containment side of the Volumetrics meter. The pressure adjusted flow rate on the Brooks was approximately 8.59 scfm while the Volumetrics read approximately 5.91 scfm. Using 8.59 scfm (0.147% per day) as the imposed leakage, the verification test met the plus or minus 25% of La criteria (within 12% of La). Subsequent investigation by the licensee indicated the Volumetrics meter had been calibrated with a 100 psi inlet pressure. The Brooks rotameter was corrected for the difference in calibration pressure and actual pressure. The licensee has committed to have the calibration checked for the Brooks rotameters used immediately following completion of the test.

The licensee subsequently ran another verification test which was not observed by the inspector. An imposed leakage of 0.1% per day was used using the Brooks rotameter. The measured and calculated results correlated within 2% La.

The matter relating to the use of the Brooks rotameter is considered unresolved pending results of the calibration verification.

d. Leak Rate Calculation Verification

The inspector took a sample of seven data points and verified thru independent calculations the calibration corrections for temperature, dew point and pressure. Average temperatures and corrected pressures were also verified.

Using the licensee's computer listing of corrected average temperatures and pressure, the inspector independently calculated the Total Time and Mass Plot leak rates with the 95% confidence interval for the first full pressure test. The following are the comparable results:

Calculated Leak Rate/95% Confidence Interval

	<u>Licensee Calculations</u>	<u>Inspector Calculations</u>
Total Time	0.019% \pm 0.044%	0.0192% \pm 0.0445%
Mass Plot	0.019% \pm 0.007%	0.0195% \pm 0.0073%

The acceptance criteria, in accordance with the FSAR and Appendix J to 10 CFR 50, was 0.75 La (0.075% per day).

The verification test results were also independently verified. The inspector's results correlated very closely with those calculated by the licensee as stated in paragraph 4.c. above.

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

5. Review of Licensee Event Report 77-15 - Unit No. 1

The inspector reviewed the Licensee Event Report (LER) which related to leakage in three containment isolation valves in excess of Technical Specification and 10 CFR 50, Appendix J requirements (see paragraph 2 above). It was determined from the review that proper licensee reviews had been conducted and proper corrective action had been taken.

The inspector determined that the cause description on the LER was misleading. The cause, "foreign matter," is descriptive of the failure of the air operator which caused isolation valve CV-6202 (penetration 51) to gradually open. Valve seal adjustment was determined to be the cause of the leakage of penetrations V-1 and V-2.

This matter is considered unresolved pending issuance of an amendment to LER 77-15.

6. 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. The following unresolved items were identified during the inspection:

313/7718-1 LER Cause Description Misleading (paragraph 5)

368/7723-1 Rotameter Calibration Verification (paragraph 4.c)

7. Exit Interview

An exit interview was conducted on October 21, 1977, following completion of the Unit No. 1 inspection. At the interview, the inspector discussed the findings indicated in paragraphs 2, 5 and 6. The licensee acknowledged these findings and committed to issue an amendment to LER 77-15 clearly stating the cause description.

On October 25, 1977, the exit interview was conducted for the Unit No. 2 portion of the inspection. At this interview, the inspector discussed the findings indicated in paragraphs 3, 4 and 6. The licensee acknowledged these findings and committed to having the Brooks rotameters calibration verified.