U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-373/86022(DRS)

Docket No. 50-373 License No. NPF-11

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Facility Name: LaSalle County Station, Unit 1

Inspection At: LaSalle Site, Marseilles, Illinois

Inspection Conducted: June 3 - July 3, 1986

Inspector: working for R. Mendez — 7/10/86 Date

working for S. M. Hare — 7/11/86 Date

Approved By: working M. A. Ring, Chief
Test Programs Section — 7/11/86 Date

Inspection Summary

Inspection on June 3 - July 3, 1986 (Report No. 50-373/86022(DRS))
Areas Inspected: Routine, announced inspection by two regional inspectors of Containment Integrated Leak Rate Test (CILRT); CILRT performance witnessing; local leak rate and test results; as-found CILRT results; action on a previous inspection finding; and licensee event report followup. NRC inspection modules utilized during this inspection include 70307, 70313, 70323, 61720 and 92701.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)
*G. Diederich, Plant Manager
+R. D. Bishop, Services Superintendent
*P. F. Manning, Technical Staff Supervisor
+T. A. Hammerich, Technical Staff Compliance
*R. W. Stubert, QA Supervisor
*R. S. Dus, Technical Staff Engineer
*H. Vinyard, Technical Staff Engineer
*J. Ulrich, Technical Staff Engineer
*D. Winterhoff, Technical Staff Engineer

U. S. Nuclear Regulatory Commission
•R. Kopriva, Resident Inspector
•J. Bjorgen, Resident Inspector

The inspectors also interviewed other licensee employees including members of the technical and operating staff.

*Denotes persons in attendance at the preliminary exit conducted on June 12, 1986.

+Denotes persons in attendance at the exits conducted on June 12 and July 3, 1986.

•Denotes persons in attendance at the exit conducted on July 3, 1986.

2. Licensee Event Report Followup

(Closed) Licensee Event Report No. 85-066-00 (373/85066-LL): A feedwater check valve was reported as having failed a local leak rate test. Inboard isolation valve 1B21-F010B failed with a leakage of 1982 standard cubic feet per hour (SCFH) which exceeded the 0.6 La limit of 231.4 SCFH. During a review of valve lineups, the inspectors noted that the inboard isolation valve was 1B21-F010A and not 1B21-F010B as stated in the LER. The licensee was informed and agreed that the LER was in error. The licensee has committed to issue a revised LER and this action will be tracked per Action Item Request (AIR) 373-200-85-19700. The inspectors reviewed Work Request L51592 which was issued to initiate action to repair the valve. A local leak rate test was performed at the completion of the repair work. The calculated leak rate in the as-left condition was determined to be 4.94 SCFH for both the inboard and outboard valves.

3. Action on a Previous Inspection Finding

(Closed) Open Item (373/83028-04): Temperature and humidity surveys required by Paragraph 7.4 of ANSI N45.4-1972 had not been previously performed. The inspectors reviewed the temperature and humidity data obtained by the licensee in the survey during this CILRT and determined that placements of RTDs and dewcells reflected an accurate measurement of the average temperature and humidity for each subvolume.

4. Containment Integrated Leak Rate Test (ILRT)

a. Procedure Review

The inspectors reviewed Revision 9 of procedure LTS-300-4 titled, "Unit 1/2 Primary Containment Integrated Leak Rate Test (ILRT)," relative to the requirements of 10 CFR Part 50, Appendix J, and ANSI N45.4-1972. With the exception of the following open item, the procedure was adequate.

The LaSalle drywell containment free volume is given as 394,638 cu. ft. as documented in Table 6.2-1 of the LaSalle FSAR and page 31 of procedure LTS-300-4. The total free volume used in the licensee's program to calculate the weighted volume fraction was given on page 165 of procedure LT-300-4 as 394,500 cu. ft. This item is considered an open item pending licensee resolution of this matter (373/86022-01).

b. Summary of Appendix J Requirements

To ensure the licensee's understanding of Appendix J requirements, the inspectors conducted numerous discussions with licensee personnel during the course of the inspection. The following is a summary of the requirements discussed with the licensee.

(1) Whenever penetration configurations during a CILRT deviate from the ideal, the results of LLRTs for such penetrations must be added as a penalty to the CILRT results at the 95% confidence level. This penetration leakage penalty is determined using the "minimum pathway leakage" methodology. This methodology is defined as the minimum leakage path (e.g., the smallest leakage of two valves in series). This assumes no single active failure of redundant leakage barriers. Additionally, any increase in containment sump, reactor water, or suppression pool (torus) level during the course of the CILRT must be taken as a penalty to the CILRT results. If penalties exist, they must be added (subtraction is never permitted) to the upper confidence level of the CILRT results.

(2) The Type A test length must be 24 hours or longer to use the mass point method of data reduction. If tests of less than 24 hours are planned, the Bechtel Topical Report BN-TOP-1 must be followed in its entirety except for any section which conflicts with Appendix J requirements. For either methodology, the acceptance criterion is that the measured leakage at the 95% upper confidence limit must be less than 75% of the maximum allowable leak rate for the pressure at which the test was performed.

(3) For the supplemental test, the size of the superimposed leak rate must be between 0.75 and 1.25 times the maximum allowable

leak rate La. The higher the value the better. The supplemental test must be of sufficient duration to demonstrate the accuracy of the test. The NRC looks for the results stabilizing within the acceptance criteria, not just being within the acceptance criteria. Whenever the BN-TOP-1 methodology is being used, the length of the supplemental test cannot be less than approximately one-half of the length of the CILRT.

(4) An acceptable method for determining if the sum of Type B and C tests exceeds the 0.60 La Appendix J limit is to utilize the "maximum pathway leakage" method. This methodology is defined as the maximum leakage value that can be quantified through a penetration leakage path (e.g., the larger, not total, leakage of two valves in series). This assumes a single active failure of the better of two leakage barriers in series when performing Type B or C tests.

(5) Future periodic Type A, B, and C tests must include both as-found and as-left results. In order to perform Type B and C test repairs prior to a Type A test, an exemption from Appendix J requirements should be obtained from NRR. The exemption should state how the licensee plans to determine the as-found condition of the containment since local leak rate tests are being performed prior to the CILRT. An acceptable method is to commit to add any improvements in leakage rates which are the result of repairs or adjustments (RAs) using the "minimum pathway leakage" methodology.

c. Instrumentation

The inspector reviewed the instrument calibration data associated with instruments used in determining the containment leak rate. A multi-point calibration of all instrumentation was performed. The inspectors verified that the primary testing standards were traceable to national standards and that the instruments used during the CILRT were calibrated within the required tolerances. The following instrumentation was used in the CILRT:

Type	Quantity
RTD's	30
Dewcells	10
Pressure Gauges	2
Rotometers	2

d. Pretest Requirements

The inspectors performed a pretest general containment walkdown to verify the placement of the test instrumentation. During this walkdown the inspectors also verified that pressurized components such as fire extinguishers and MSIV and SRV accumulators had been

removed and depressurized and vented respectfully. The inspectors also verified the validity of the pre-test stabilization period and conformance of the test prerequisites to the requirements of 10 CFR 50, Appendix J, and ANSI N45.4-1972.

e. Valve Lineup Verification

Portions of valve lineups for the following systems were verified correct to ensure that no fluid could enter the containment atmosphere and that proper venting was provided or penalties taken:

System

Service air
Instrument air
Reactor Water Cleanup
Containment Monitoring
Feedwater
Main Steam
Reactor Building Equipment Drains
Residual Heat Removal

During a review of the valve lineup for the ILRT procedure, the inspectors noted that feedwater valves 1B2-F065A and 1B21-F065B and RCIC turbine exhaust valve 1E51-F068 were closed for the Type A test. While these valves are listed in FSAR Table 6.2-21 as containment isolation valves, they require operator action to close and are generally for "long-term leak tightness only." Through conversations with the Region III inspector and the Containment Systems Branch reviewer from NRR for the LaSalle preoperational leak test program, the inspectors learned that the licensee was informed that credit could not be taken for the feedwater motor-operated isolation valves. In addition, the NRC has not historically given credit for the operator closing these valves and has required them to be open during the Type A test. If no credit is given for the motor-operated feedwater isolation valves, the licensee would fail the As-Found Type A test this outage because of excessive feedwater check valve leakage (see paragraph 4.k.). This information is being forwarded to the Office of Nuclear Reactor Regulation and is considered an unresolved item (373/86022-02(DRS)) pending their response.

f. Test Witnessing

The licensee started pressurization of the containment at 12:30 p.m. on June 4, 1986. Pressurization was terminated at 12:50 a.m. and the stabilization period started five minutes later on June 5, 1986. The CILRT test was officially started at 7:30 a.m. and the 24 hour test was terminated the following morning on June 6, 1986. The licensee then began the supplemental test by inducing a controlled leak through a flowmeter at 8:20 a.m. and successfully completed the test at 1:30 p.m. on June 6, 1986.

g. CILRT Data Evaluation

The inspectors independently monitored and evaluated the leak rate data to verify the licensee's calculation of the leak rate. There was acceptable agreement between the inspector's and licensee's leak rate calculations as indicated in the following summary (units are in weight percent per day):

Measurement	Licensee	Inspector
Leakage rate calculated (Lam) during CILRT	.2254	.2246
Lam at 95% confidence level	.2273	.2272
Lam at 95% confidence level adjusted to reflect penalties (refer to Paragraph 5.i.)	.2690	

h. Supplemental Test Data Evaluation

After satisfactory completion of the 24 hour test, the licensee induced a known leakage (Lo) of 373.265 SCFH or .6144 weight percent/day. The inspectors independently monitored and evaluated the leak rate data to verify the licensee's supplemental leak rate calculations. There was acceptable agreement between the inspector's and licensee's calculations as indicated in the following (units are weight percent per day).

Measurement	Licensee	Inspector
Calculated leakage (Lc) rate during supplemental test	.7902	.7916
Lc at 95% confidence level	.8105	.8115

Appendix J acceptance criterion: $Lo + Lam - .25\ La < Lc < Lo + Lam + .25\ La = .681 < .811 < .997$

As indicated above, the supplemental test results satisfied the requirements of 10 CFR Part 50, Appendix J.

i. CILRT Valve Lineup Penalties

Due to valve configurations, which deviated from the ideal penetration valve lineup requirement for the CILRT, the following penalty of .04174 weight percent per day was added to the Type A test results using the minimum pathway leakage method.

Penetration	Penetration Leakage Based on The Minimum Pathway Methodology (Units are in SCFH)
Reactor Building Cooling Water Supply	0.05
Reactor Building Cooling Water Return	0.05
Chilled Water "A" Supply	3.57
Chilled Water "B" Supply	0.05
Chilled Water "A" Return	0.05
Chilled Water "B" Return	1.38
Reactor Water Cleanup Suction	2.03
Recirculation Loop Sample	0.05
Drywell Equipment Sump	0.33
Drywell Floor Sump	0.27
Drywell Equipment Sump Cooling	0.05
Inboard MSIV Drain	2.19
RHR Shutdown Cooling Suction	2.04
RCIC Steam Supply	0.523
ECCS/RCIC (Worst Division)	2.94
Hydrogen Recombiner	8.624

Total = 24.197 SCFH = 0.04174 wt %/day

j. Local Leak Rate Test Result Review

The inspectors reviewed the local leakage rate test results for B and C tests to determine the adequacy of the licensee's local leak rate program. Appendix J requires that the sum of Types B and C tests will not exceed .6 La or .381 wt %/day for LaSalle Unit 1. The total as-found maximum pathway leakage for four excessively leaking valves was determined to be approximately 4,100 SCFH or 6.75 wt %/day. The following valves were tested by the licensee and found to leak excessively:

Valve	Leakage (SCFH) As-Found	As-Left
Reactor Feedwater 1B21-F010A	1,892	4.94
Reactor Feedwater 1B21-F032B	2,000	2.78
RHR Shutdown 1E12-F009	67	43.20
RHR Drywell Spray 1E12-F016A	130	0.42

The total as-left leakage of all isolation valves including those above (after repair) was determined to be .248 wt %/day and is less than the allowable .6 La (or 0.381 wt %/day).

k. As-Found Condition of CILRT Results

The as-found condition is the condition of the containment at the beginning of the outage prior to any repairs or adjustments to the

containment boundary. If adjustments are made to the containment boundary prior to the Type A test, local leak rate tests must be performed to determine the leakage rates before and after the repair or adjustment. The as-found Type A test result can then be obtained by adding the difference between the affected path leakages before and after the adjustments to the overall Type A test results. LaSalle is limited to a leakage rate of .476 weight percent/day (.75La) for the as-found Type A test. The inspector reviewed the as-found and as-left leak rate test results to determine an as-found Type A test result. The following is a summary of the as-found containment leak rate (units are in weight percent per day):

Measurement	
Penalties incurred due to repairs or adjustments prior to the CILRT	.269
CILRT valve lineup penalties	.042
As-found Type A test results	.227
Total as-found	.538

The licensee passed the as-left CILRT; however, as indicated above, the as-found condition of .538 is greater than the allowed leakage of .476 and exceeds the allowable limit of Appendix J (0.75 weight percent/day). The licensee failed using the numbers above because of the feedwater check valves which leaked excessively in the as-found condition. Using the minimum pathway leakage method, the feedwater check valves accounted for .148 wt %/day of the total of .269 wt %/day penalties incurred or adjustments prior to the CILRT. Without the feedwater valves the total as-found result would be .390 wt %/day. The question of whether the licensee passed or failed this as-found Type A test will depend on resolution of unresolved item 373/86022-02 (see paragraph 4.e.). The inspectors informed the licensee of the above pending issue. In addition, the inspectors will forward the unresolved issue to NRR for resolution.

5. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during this inspection is discussed in Paragraph 4.a.

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of violation, or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 4.e.

7. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at a preliminary exit on June 12, 1986, and again by telephone at the conclusion of the inspection on July 3, 1986, and summarized the scope and findings of the inspection. The licensee acknowledged the inspectors' statements. The inspectors discussed the likely informational content of the inspection report with regard to documents reviewed by the inspector. The licensee did not identify any such documents as proprietary.