

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report Nos. 50-317/85-33  
50-318/85-33

Docket Nos. 50-317  
50-318

License Nos. DPR-53  
DPR-69

Licensee: Baltimore Gas and Electric Company  
P. O. Box 1475  
Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Nuclear Power Plant, Units 1 & 2

Inspection At: Lusby, Maryland

Inspection Conducted: November 18-25, 1985

Inspectors:

S. D. Kucharski  
S. D. Kucharski, Reactor Engineer

12/20/85  
date

J. A. Golla  
J. A. Golla, Reactor Engineer

12/20/85  
date

Approved by:

Jon R. Johnson  
J. R. Johnson, Chief, Operational Programs  
Section, Operations Branch, DRS

12/20/85  
date

Inspection Summary: Inspection on November 18-25, 1985 (Inspection Report Nos. 50-317/85-33 and 50-318/85-33).

Areas Inspected:

Unit 1: Routine followup of licensee actions on previous findings in the areas of local leak rate tests (LLRT) and integrated leak rate tests (ILRT). The inspection involved 3 hours onsite by two region-based NRC inspectors.

Results: No violations or deviations were identified.

Unit 2: Routine announced inspection of procedure review, test witnessing and results evaluation of LLRT and ILRT activities, review of unresolved items and tours of the facility. The inspection involved 123 hours onsite by two region-based inspectors.

Results: No violations or deviations were identified.

## DETAILS

### 1.0 Persons Contacted

#### 1.1 Baltimore Gas and Electric Company

R. Androsik, General Supervisor  
\*O. P. Bulich, Plant Engineer (Test Supervisor)  
\*J. R. Dunn, Plant Engineer  
\*J. M. Moreira, General Supervisor  
\*W. E. Putiman, Sr. QA Auditor  
\*E. H. Roach, QA Specialist  
\*M. E. Roberson, General Supervisor  
D. Ross, I&C Supervisor  
J. Schoolcraft, General Supervisor  
\*L. B. Russell, Plant Superintendent  
\*R. B. Sydnor, Supervisor E&C Engineers  
\*T. L. Sydnor, Principal Engineer-Technical Support

#### 1.2 NRC

\*T. Foley, Sr. Resident Inspector  
\*C. A. Petrache, Engineer (International Assignee)

\*Denotes those present at exit meeting on November 25, 1985

### 2.0 Licensee Action on Previous NRC Findings-Unit 1

#### 2.1 (Closed) Unresolved Item (50-317/82-07-08) Establish as-found leakage rates for 9 penetrations.

The licensee has stated that their policy (for all type B&C testing) is to establish the as-found condition of any leakage pathway before making repairs to it. The inspector reviewed the on-going type B and C leak rate testing and as-found leakage measurements for a selected sample of penetrations. Based on this review, this item is closed.

#### 2.2 (Closed) Violation (50-317/82-07-11) Operation of Facility From 12/18/80 to 4/18/82 with containment leakage greater than allowed.

Plant operation with containment leakage greater than allowed from 12/18/80 to 4/18/82 occurred as a result of an error introduced into a revision of STP M-571-2. This procedure was approved by the Plant Operations and Safety Review Committee (POSRC). The inspector reviewed Revision 13 to STP M-571-2 and verified that the error has been corrected. Additionally, the licensee has established several control measures such as QA surveillance and training of new POSRC members to assure that POSRC responsibilities are being carried out in a technically complete and competent manner. This item is closed.

### 3.0 Licensee Action on Previous NRC findings -Unit 2

#### 3.1 (Closed) Unresolved Item (50-318/82-26-01) LLRT results corrections to be reported in summary technical report.

The inspectors reviewed the summary technical report. The information in question (LLRT for 3 penetrations, repairs and adjustments to containment boundary) was found to be adequately presented therein. This item is closed.

#### 3.2 (Closed) Unresolved Item (50-318/82-26-02) ILRT results corrections to be reported in summary technical report.

The inspectors reviewed the summary technical report. The information in question (corrections for 4 penetrations) was found to be adequately presented. This item is closed.

### 4.0 Containment Local Leak Rate Testing-Unit 2

#### 4.1 Documents Reviewed

- STP No. M-571-2, Local Leak Rate, Revision 13, 9/9/85
- LLRT Calibration Records
- LLRT Results Record of Running Total
- CCNPP2 LLRT Related Technical Specifications
- ITEC-104 Leak Rate Monitor (LRM) Test Report for 3 LRM's 10/10/85
- Volumetrics Test Report for Flow Standard Serial No.: 7929, Document No. 83308488, 11/22/85
- Volumetrics Test Report for Flow Standard Serial No. 7929, Document No. 833081091, 2/8/85
- Test Equipment Calibration Procedure ITEC-104C, 3/7/83, Rev. 1
- Ametek/Mansfield and Green Certification Report for Dead Weight Tester Serial No. 68780 and 68781 dated 8/3/83 and 9/12/84 respectively
- Selected piping and instrumentation diagrams

#### 4.2 Scope of Review

The inspector reviewed the above documents to ascertain compliance with Regulatory Requirements of 10 CFR 50, Appendix J, Calvert Cliffs Unit 2 Technical Specifications, applicable industry standards and station administrative guidelines. The inspector also witnessed local leakage testing, held discussions with the licensee regarding the documentation of test results, the repair and retesting following failed tests, and the relationship of these items to the "As-Found" and "As-Left" condition of containment as applied to CILRT results.

#### 4.3 Procedure Review

The procedures reviewed were technically accurate and in conformance with the regulatory requirements of Appendix J to 10 CFR 50 and applicable industry standards. The LLRT coordinator and associated licensee personnel have inspected piping configurations to assure that the appropriate line-up drawings in the LLRT procedures are accurate and in accordance with leakage testing requirements. No unacceptable conditions were identified.

#### 4.4 Test Witnessing

On November 21, 1985 the inspector witnessed a type C LLRT of penetration 13 which involved the containment purge supply valves. The volume between the purge valves would not hold the test pressure of 50 psig. The test was discontinued that day and maintenance was performed on the purge valves. A successful pressure decay test was performed on November 22, 1985. A similar sequence of events occurred for the containment purge exhaust valves on the 21st and 22nd of November 1985. The tests were run according to STP-M-571-2. The inspector verified that the test was being conducted in accordance with the above procedure, and that the technicians involved in the test were knowledgeable of requirements and use of the test instruments.

No unacceptable conditions were identified.

#### 4.5 LLRT Instrument Calibration

The inspector reviewed the calibration records for the flow indicators, temperature gauges and pressure indicators used in the LLRT instrument boxes. Also reviewed were the calibration records of the standards used to calibrate the test instrumentation. During the review process the inspector noted an extension of the calibration due dates for the standards. The inspector requested the licensee to provide the basis and justification for these extensions. The licensee could not justify the extension period.

The licensee immediately performed calibration checks for the two dead weight testers in question and verified that the instruments were still in calibration. The licensee also sent the flow standard back to the vendor for calibration. The licensee has agreed to change Calvert Cliffs Instruction 120, Revision D, dated October 24, 1985 to allow the supervisor to lengthen or shorten the calibration date based upon the past performance of the instrument. This will be accomplished by a more detailed guideline to justify the extension or shortening of the calibration frequency. The licensee has also agreed to adjust, if need be, the results of the LLRT's based on any adjustments that are made to the standards. This is an unresolved item pending completion of the calibration of instruments and adjustments, if any, to the LLRT results (50-318/85-33-01).

#### 4.6 Test Results

The inspector reviewed the LLRT results summary and discussed analyses of test failures, repairs and retests with the licensee. The inspector noted that the licensee had a general method for conservatively choosing the maximum pathway leakage for penetrations involving complex valve networks. No unacceptable conditions were identified. However, the calibration concerns identified in Section 4.5, may affect the final as-found and as-left local leak rates. This concern remains unresolved and will be tracked as part of item 50-318/85-33-01 described in Section 4.5 above.

### 5.0 Containment Integrated Leak Rate Test - Unit 2

#### 5.1 Documents Reviewed

- ILRT valve lineups
- ILRT related technical specifications
- Instrumentation selection guide calculation
- Containment volume fraction calculation

- STP M-662-2 integrated leak rate test Unit 2 containment Rev. 3, 10/21/85
- NPD-TS, Part 3 ILRT checklist
- Procedure QQASP 7 Rev. 22, 10/3/85, quality assurance department
- RTD calibration check for 18 drybulb sensors
- Calibration check for 6 dewpoint sensors
- Procedure FTI-123 RTD calibration, 5/8/85
- Calibration data for precision pressure gauge, Serial No. 1558-1745, documentation No. 85041401, 11/8/85
- Calibration data for time clock No. 7146-0, 12/17/85, document No. 85422113
- Calibration data for flowmeters Serial Nos. 1579 and 30004, Document No. 85 30 2113, 10/7/85

## 5.2 Scope of Review

The inspector reviewed the above listed documents for technical adequacy and to ascertain compliance with the regulatory requirements of 10 CFR 50, Appendix J, Technical Specifications and applicable industry standards. The inspector witnessed activities related to the CILRT and the subsequent verification test. The inspector also performed an independent calculation of the test results.

## 5.3 Procedure Review

The inspector reviewed the documentation for technical adequacy and for consistency with regulatory requirements, guidance and licensee commitments. Review of the procedure's acceptance criteria, test methods and references indicated adequate conformance with 10 CFR 50, Appendix J. The inspector reviewed the procedure valve line-ups for piping penetrations. This review was to ensure that systems were properly vented and drained to expose the containment isolation valves to containment atmosphere and test differential pressure with no artificial boundaries. No unacceptable conditions were identified.

#### 5.4 CILRT Instrument Calibration

The inspector reviewed the calibration records for the resistance temperature detection (RTD's) and dew point instruments, precision pressure detectors, and the verification test flow meter. Their calibrations prior to the CILRT were found to meet applicable accuracy requirements and were traceable to the National Bureau of Standards.

No unacceptable conditions were identified.

#### 5.5 CILRT Chronology

<u>Date</u>	<u>Time</u>	<u>Activity</u>
11/23/85	0020	Commenced pressurization of containment 8 compressors in operation
	0049	Loss of temperature indication from RTD 18
	0745	Checked containment outer boundary for leakage
	1300	Stop pressurization at 50. psig, began stabilizing period.
	1350	Outer boundary of containment checked for leakage - no reported major leaks.
	2345	Analysis indicated that dew cells on catwalk were inoperative.
	2355	Shut breaker 20511 - Dewcells now operating.
11/24/85	0100	Lost temperature indication from RTD 3
	0347	Lost temperature indication from RTD 2
	0400	Commenced ILRT
	1000	RTD 6 was deleted - reading was 10° F. higher than comparable value



1230	Completed ILRT and initiated verification test by superimposing a flow of 12.3 SCFM
1700	Problem with pressure tracking from pressure indicator
1845	Pressure indicators are tracking pressure
1900	Start verification test
2315	Completed data collection for verification test
2317	Commenced depressurization

#### 5.6 Test Performance/Control

The test was performed within the guidelines of the procedure. Procedural precautions were adhered to, especially those related to manipulation of containment boundaries after the commencement of testing. Two problems did occur: one during the stabilization period and one during the verification test. Both situations were handled adequately by the licensee.

The first problem dealt with the dew cells. As stated in the Chronology, the dew cells were inoperative until 2355. The licensee discovered this and reinitiated the 4 hour-stabilization period. The second problem, which occurred during the verification test, had to do with a pressure indicator that was stuck. Once this indicator was reading correctly, the licensee ran the verification test for an additional four hours and fifteen minutes, which was in accordance with BN-TOP-1.

No unacceptable conditions were identified.

#### 5.7 Test Results Reviewed

The licensee evaluated the test results for the November 24, 1985 8 1/2 hour ILRT period (0400-1230). The calculated leakage rate at the upper confidence limit was 0.060 weight percent per day for the mass point calculation and 0.104 weight percent per day for the total time method. The test acceptance criteria based on 0.75 La is 0.150 weight percent per day.

The inspector performed an independent calculation of the test results using the raw data from the test to compare the results with the licensee's leak rate calculation.



A comparison of licensee to NRC results is given below:

The units are weight percent per day. Allowable is 0.150.

Licensee

Mass Point - 0.052, UCL - 0.060  
Total Time - 0.050, UCL - 0.104

NRC

Mass Point - 0.052, UCL - 0.060  
Total Time - 0.049, UCL - 0.104

The above values reflect the as-left condition of the containment. The as-found results are pending because of an unresolved item discussed in section 4.5 of this report. The results of the "as-left ILRT were well within the Technical Specification limit of 0.75 La for such tests.

The CILRT was followed by a successful superimposed leak verification test. The licensee imposed a leak of 12.34 SCFM or 0.200 weight percent per day on the existing overall leakage. The test results were within the acceptance criteria band.

The inspector also verified these results by independent calculations. The results are as follows:

a. Licensee

1. Mass point band  
(0.202<0.243<0.302)
2. Total time band  
(0.200<0.251<0.300)

b. NRC

1. Mass point band  
(0.202<0.232<0.302)
2. Total time band  
(0.200<0.239<0.300)

No unacceptable conditions were identified.

## 6.0 Facility Tours

The inspector conducted inspection tours independently and with licensee personnel both before and during the CILRT. During these tours, the

inspector observed operations and activities in progress, implementation of radiological controls, and the general condition of safety-related equipment. In addition, the inspector examined the containment system boundaries, component tagging, and instrumentation to support the CILRT. During these tours the inspector observed licensee personnel checking for evidence of leakage and verifying selected valves to be in the correct position according to procedural requirements.

No unacceptable conditions were identified.

#### 7.0 Independent Calculations

The inspector performed independent calculations of the test results of the CILRT and subsequent verification test. Details are included in Section 5.7 of this report.

#### 8.0 QA/QC Involvement

The inspector reviewed the QA procedures which are listed in Section 5.1 and found them to be adequate. The inspector also verified QA involvement in monitoring the testing activities. The QA personnel were knowledgeable of their responsibilities, and the test and surveillance requirements.

No unacceptable conditions were identified.

#### 9.0 Exit Meeting

A meeting was held on November 25, 1985 to discuss the scope and findings of the inspection as delineated in this report. At no time during this inspection was written information provided to the licensee.