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

Region I

Report No. 50-317/78-25
50-318/78-19

Docket No. 50-317
50-318

License No. DPR-53
DPR-69 Priority -- Category C
C

Licensee: Baltimore Gas and Electric Company

P. O. Box 1475

Baltimore, Maryland 21203

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

Inspection at: Lusby, Maryland

Inspection conducted: September 5-8, 1978

Inspectors: J. C. Higgins, Reactor Inspector — 9/25/78 date signed

T. H. Smith, Reactor Inspector — 9/25/78 date signed

H. J. Wong, Engineer/Intern — 9/25/78 date signed

Approved by: for D. L. Caphton Chief, Nuclear Support Section No. 1, RO&NS Branch — 9/25/78 date signed

Inspection Summary:

Inspection on September 5-8, 1978 (Combined Report Nos. 50-317/78-25 and 50-318/78-19)

Areas Inspected: Routine, unannounced inspection by regional based inspectors of the Containment Integrated Leak Test report (Unit 1), local leak rate testing, licensee action on previous inspection findings, plant operations, tendon surveillance testing (Unit 1), selected licensee events, and the inservice test program for pumps and valves. The inspection involved 61 inspector-hours (Unit 1 - 41 hours, Unit 2 - 20 hours) on site by three NRC regional based inspectors.

Results: Of the seven areas inspected, no items of noncompliance were found in five areas; one item of noncompliance was found in one area (Unit 1) (infraction - failure to conduct Type B tests within two years, paragraph 4.b) and one item of noncompliance in another area (Unit 2) (infraction - failure to follow approved procedure, paragraph 7.b).

DETAILS

1. Persons Contacted

*M. Bowman, Supervisor QA Audit Unit
*J. Carroll, Performance Engineer
*R. Denton, Supervisor - Technical Support
R. Douglass, Chief Engineer
S. Jones, Performance Engineer
*J. Lemons, Nuclear Plant Engineer - Maintenance
J. Lawson, Instrument Maintenance Shop Foreman
W. Lippold, Nuclear Engineer
H. McCall, Performance Engineer
*M. Miernicki, Surveillance Test Engineer
J. Mihalcik, Performance Engineer
*L. Russell, Nuclear Plant Engineer - Operations

The inspector also talked with and interviewed several other licensee employees during the inspection. They included members of the technical and engineering staff, control room operators, and instrument and maintenance department technicians.

* denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (317/78-15-02): The licensee has revised the index page of STP-O-7-1 to reflect the fact that a portion of the procedure has been removed. This item is resolved.

(Open) Unresolved Item (317/78-15-01): The inspector reviewed procedure OP-6 now in Revision 9. It was noted that OP-6 still references subject matter in STP-O-7-1 which is no longer contained in that procedure. The licensee's representative stated that procedure OP-6 will be corrected prior to September 30, 1978.

(Closed) Unresolved Item (317/78-09-01): This item is closed based upon inspector review of the documentation of the actual instrumentation locations. The licensee's representative stated that these locations would be incorporated into Procedure STP No. 1-T-1 prior to the next containment integrated leak rate test.

(Open) Unresolved Item (317/78-09-02): STP No. 1-T-3 completed on March 3, 1978, had all previous crack patterns attached and was signed off as acceptable. The inspector, however, noted that when comparing the new data with the old that new cracks had appeared. Additionally, there was no definitive acceptance criteria in the procedure and the reviewing engineer did not justify the acceptability of the new cracks. This item remains open.

3. Containment Integrated Leak Rate Test (CILRT)

a. General

-- STP No. 1-T-1, "Integrated Leak Rate Test Unit 1 Containment."

-- "Reactor Containment Building Integrated Leakage Rate Test Report, April 24, 1978."

-- QA Audit No. 16-9-78, performed March 4, 6, and 8, 1978.

-- Technical Specification (TS) 3.6.1.2.

The above references were reviewed for: accurate data transcription, proper instrument calibration, proper implementation of procedural changes, correctness of the analytical methods, resolution of the Quality Assurance concerns, and the accurate recording of significant events during the test. No items of noncompliance were identified.

b. Satisfactory CILRT

The inspector performed calculations and using raw data independently verified: the proper inclusion of instrument calibration corrections, the computed contained air mass values, the containment leakage rates, and the 95% confidence intervals. Local leak rate test additions (Type B and C) were verified to be insignificant as compared to the overall CILRT leakage. The test results are presented in Table 1. The inspector's independent calculations agree substantially with the licensee's values and indicate that the CILRT was satisfactorily completed. The inspector had no further questions.

4. Local Leak Rate Testing (LLRT)

a. General

The inspector reviewed the LLRT summary portion of the CILRT report and the supporting records and procedures that the licensee held on site. With the exception of the below items, the inspector had no further questions in this area.

b. Type B Test Interval

Section III.D.2 of Appendix J to 10 CFR 50 requires Type B tests to be performed during each reactor shutdown for refueling, or other convenient intervals, but in no case at intervals greater than two years. Electrical penetrations, however, were not Type B tested during the period November 1973 to March 1976. This is an item of noncompliance (317/78-25-02).

c. Record Retention

Technical Specification 6.10.1 and Technical Specification 4.5.B.3 (Technical Specifications in effect prior to Amendment 20) require that air lock leak tests be conducted at intervals of six months and that records be retained for five years. During review of past testing, air lock leak tests dated October 6, 1976, October 14, 1975, April 1975, and October 1974, were not available, but the licensee's representative stated that tests were performed and that further searching should produce the records. This is an unresolved item (317/78-25-01).

d. Air Lock Door Seals

The licensee is required by TS 4.6.1.3.a to test air lock door seals to a pressure of 15 psig with a precision flow measurement test after each opening. This test is accomplished using procedure STP M-171. The procedure is performed at a pressure of 30 psia $\pm$ 0.2 psi and does not document barometric pressure. Thus, there is no documentation that the 15 psig test pressure has been met. Additionally, the procedure allows

the option of a pressure decay test vice the required precision flow measurement test. None of completed tests reviewed by the inspector had utilized either the -0.2 psi option or the pressure decay option. This item is unresolved pending revision of the test procedure and is designated (Items Nos. 317/78-25-12 and 318/78-19-12).

e. Air Lock Pa Test

The licensee is required by TS 4.6.1.3.b to test the overall air lock to Pa (50 psig) once per six months. In several of the tests performed using STP M-471 the licensee nonconservatively had recorded the leakage as zero, when his instrumentation was not sufficiently sensitive to justify this value. The minimum sensitivity of the pressure decay test can be calculated using one-half of the smallest division on the pressure gauge, the test volume, and the test time. This item is unresolved pending revision of the procedure to specify use of the test's minimum sensitivity when appropriate (Item Nos. 317/78-25-13 and 318/78-19-13).

f. Report Errors

During the review of the licensee's CILRT report the inspector noted that Penetrations 62 through 69 had incorrect values reported and that not all of the information required to be reported by Section V.B.3 of Appendix J had been included. As an example, no mention was made of any air lock door seal tests and not all of the airlock Pa tests were reported. This item is unresolved, pending correction of the report (317/78-25-03).

g. Containment Isolation Valve (CIV) Testing

(1) The licensee utilizes STP M-571 for Type C testing of CIV's. Appendix J, Section III.C.1 requires that the test be performed with air or nitrogen. The procedure cautions that the line must be drained of water but does not specify that both sides of CIV's being tested should be drained and does not give individual draining valve lineups. This item is unresolved pending revision of the procedure to ensure that all water on both sides of CIV's is drained whenever practicable.

(2) Procedure STP M-571 has no provision for updating the Type B and C leakage rate total and verifying that TS 3.6.1.2 for containment integrity is met after maintenance is performed on a CIV. This item is unresolved pending revision of the procedure to require updating of the leakage totals when required. These items relating to STP M-571 are designated (317/78-25-14 and 318/78-19-14).

5. Inservice Testing of Pumps (Units 1 and 2)

a. General

The inspector reviewed the following documents relating to the monthly inservice testing of safety related pumps.

-- Letters from BG & E to NRC(NRR) dated June 8, 1978, and August 30, 1978. (Program submittal to NRC)

-- Subsection IWP of Section XI to the ASME Boiler and Pressure Vessel Code (1974 Edition through Summer, 1975 Addenda).

-- Technical Specification 4.0.5.

-- STP O-73-1, "Engineered Safety Feature Equipment Performance Test," Revision 4, dated September 30, 1977.

-- STP O-74-1, "Engineered Safety Feature Equipment Inservice Bearing Temperature Test."

-- STP O-5-2, "Auxiliary Feedwater System," Revision 5, dated March 15, 1978.

The inspector verified that all pumps addressed in the program submittal were tested by approved procedures and that the licensee's program implementation and procedures met applicable requirements. The inspector also reviewed a sampling of test results over the past six months. With the exception of the below items the inspector had no further questions in this area.

b. Reference Values

The licensee's procedures have no provision for determining new reference values or reconfirming previous values after routine maintenance or repair, as required by Article IWP-3111 of ASME Section XI. This item is unresolved (317/78-25-05 and 318/78-19-05).

c. Bearing Temperatures

Article IWP-3500 of ASME Section XI requires that each pump be run until the bearing temperatures stabilize such that three successive readings taken at ten minute intervals do not vary by more than 3%. The STP O-74 temperature stabilization values exceed the 3% specified. This item is unresolved (317/78-25-06 and 318/78-19-06).

6. Inservice Testing of Valves (Units 1 and 2)

a. General

The inspector reviewed the following documents relating to the quarterly inservice testing of safety related valves.

-- Letters from BG & E-NRC(NRR) dated June 8, 1978, and August 30, 1978. (Program submittal to the NRC)

-- Subsection IWV of Section XI to the ASME B&PV Code.

-- Technical Specification 4.0.5.

-- STP O-65-2, "Quarterly Valve Operability Verification - Operating," Revision 3, November 3, 1977.

-- STP O-66-2, "Quarterly Valve Operability Verification - Shutdown," Revision 5, November 3, 1977.

-- STP O-67-2, "Check Valve Operability Verification," Revision 2, November 10, 1977.

-- STP O-68-1, "Refueling Cycle Valve Position Indication - Test," Revision 1, May 17, 1978.

The inspector verified, on a sampling basis, that all valves addressed in the program were tested via approved procedures and that the licensee's program implementation and procedures met applicable requirements. The inspector also reviewed a sampling of test results over the past six months. With the exception of the below items the inspector had no further questions in this area.

b. Retest Results

During the performance of STP O-65-2 on April 18, 1978, valves SI632 and SW5173 failed their stroke time tests. They were repaired using approved maintenance requests; however, retest results with stroke times were not available for review during the inspection. This item is unresolved (318/78-19-07).

c. Stroke Time Acceptance Criteria

Article IWV-3410(c)(3) requires that the test frequency be increased to once per month for those valves whose stroke time has increased a specified amount from the previous test. The licensee's procedures have no provision for comparing stroke times measured with the times recorded during the previous test. This item is unresolved (317/78-25-08 and 318/78-19-08).

d. Individual Valves Leakage Rates

Article IWV-3420(f) requires that the plant owner establish maximum permissible leakage rates for individual Category A valves and compare the test results with these acceptance criteria. Table IWV-3420-1 gives guidance for establishing these permissible leakage rates. The licensee's procedures currently do not contain individual valve leakage rate acceptance criteria. This item is unresolved (317/78-25-09 and 318/78-19-09).

e. Leakage Rate Comparisons

Article IWV-3420(g)(2) requires that the leakage rates for valves six inches or larger be compared with previous test results and that the test frequency be increased or valves repaired if the margin to the acceptance criteria is below a specified amount. The licensee's procedures have no provision for making these comparisons. This item is unresolved (317/78-25-10 and 318/78-19-10).

7. Control Room Tour (Units 1 and 2)

a. General

The inspector toured the control rooms of both units several times during the inspection to verify that manning requirements were in accordance with the Technical Specifications (TS), evolutions were being performed in accordance with plant procedures, and that various plant parameters met TS requirements. With the exception of the below item the inspector had no further questions as a result of these tours.

b. Safety Injection Tank Levels (Unit 2)

During the control room tour on September 5, 1978, at approximately 1815 hours, the inspector noted that Safety Injection Tank 21B level was at 200 inches. TS 3.5.1.b establishes the maximum level for operability as 199 inches. TS Action statement a requires that the tank be restored to an operable status within one hour or the plant be placed in hot shutdown within twelve hours. Upon examining the logs maintained by the control room operator the inspector noted the tank 21B had been logged as 201 inches during the 0800-1600 shift and as 202 inches during the 1600-2400 shift. Thus, the tank had been inoperable for greater than one hour. There was no circle around the out of specification readings, nor were there any comments as to the reason, as required by Calvert Cliffs Instruction, CCI 114, Attachment (5), step 4. This is an item of noncompliance with Technical Specification 6.8.1, which requires that procedures be implemented (318/78-19-03). Safety Injection Tank 21B level was promptly lowered to the allowable band upon identification of the out of specification by the inspector, thus satisfying the Limiting Condition for Operation. During the time of this occurrence, all of the other three safety injection tanks were within their limits.

The inspector noted that this event was aggravated by the fact that the Senior Control Room Operator for the 0800-1600 shift had reviewed the logs as required by CCI 114 without noting any abnormalities and without correction of the high level in safety injection tank 21B.

8. Post-Tensioned Tendon Surveillance Testing

a. General

-- STP No. 1-T-2, "Unit 1 Containment Tendon Surveillance," July 11, 1978.

-- Report of Unit No. 1 Post-Tensioning System Three Year Surveillance - prepared by Bechtel Power Corporation, May 1977.

-- Letter from Reid to Lundvall dated May 2, 1978.

-- Letter from Lundvall to O'Reilly dated January 31, 1977. (10 day report)

The inspector reviewed the licensee's tendon surveillance testing program, including the above references. The NRC is currently reviewing the Three Year Surveillance report and the licensee's Technical Specification change submittal. All outstanding questions relating to this surveillance have not yet been resolved, but are being addressed jointly by the NRC and the licensee.

b. Test Witness

The licensee's Five Year Tendon Surveillance Testing Program was in progress during the inspection. The tests were being conducted in accordance with Procedure STP No. 1-T-2. On September 8, 1978, the inspector witnessed a portion of the testing performed on dome tendon 2D21. Preliminary evaluations indicate satisfactory test results. The inspector verified that there was no evidence of corrosion of the tendon anchorage assembly hardware (buttonheads, stressing washer, shims, and bearing plate), the adjacent concrete had no abnormal indications, there were no off size or split buttonheads, the equipment and instrumentation in use were calibrated, and that lift off forces were acceptable. The inspector had no further questions in this area.

9. RTD Response Time Testing

During the inspection the inspector witnessed response time testing of spare primary loop resistance temperature detectors (RTD's). This testing was being performed in accordance with Procedure Number FTI-121, "Rosemount 104ABH RTD Response Time Check," dated March 13, 1978. The inspector noted that the test was being satisfactorily conducted by qualified personnel and had no further questions.

10. Snubber Piston Settings

Technical Specification 4.7.8.1.a requires that hydraulic snubbers be determined operable by a visual inspection. The NRC has determined that verification of proper snubber piston setting is an essential element of this inspection to assure operability and hence should be included in the appropriate procedures. The inspector noted that the licensee's program does not require this verification. This item is unresolved (317/78-25-11 and 318/78-19-11).

11. Unresolved Items

Items about which more information is required to determine acceptability are considered unresolved. Paragraphs 4, 5, 6, 9, and 10 of this report contain unresolved items.

12. Exit Interview

At the inspection's end the inspectors held a meeting (see Detail 1 for attendees) to discuss the inspection scope and findings. The items of noncompliance and unresolved items were identified.

Table 1

March 1978 - CILRT Conducted at Pa (50 psig)
at Calvert Cliffs Unit 1

Item	Acceptance Criteria	Reported Results	Inspector's Findings
1. CILRT Leak Rate by Mass Point Technique	--	0.097 %/Day	0.097 %/Day
2. Upper 95% Confidence Level on Leak Rate (Mass Point)	.75 La = 0.15 %/Day	0.108 %/Day	0.106 %/Day
3. Supplemental Verification Test Difference	$\leq$ 25% La	1.5% La	1.5% La
4. Type B&C Leak Rate Total	< .60La = 0.12 %/Day	0.02 %/Day	0.02 %/Day