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

Region I

Report No. 50-317/81-03
50-318/81-03

Docket No. 50-317
50-318

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

Licensee: Baltimore Gas and Electric Company

P.O. Box 1475

Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Units 1 and 2

Inspection at: Lusby, Maryland

Inspection conducted: January 26-30, 1981

Inspectors: Wm. Troskoski 3/10/81
W. Troskoski, Reactor Inspector date signed

Approved by: D. L. Caphton 3/10/81
D. L. Caphton, Chief, Nuclear Support Section No. 1, RO&NS Branch date signed

Inspection Summary:

Inspection on January 26-30, 1981 (Combined Inspection Report Nos. 50-317/81-03 and 50-318/81-03)

Areas Inspected: Routine, unannounced inspection of licensee actions on previous items; fuel handling operations, and surveillance testing related to refueling Technical Specifications for Unit 2; startup testing and data reduction for Unit 1; IE Circulars; and, administrative controls. The inspection involved 32 inspector-hours onsite by a region-based NRC inspector.

Results: Of the five areas inspected, no items of noncompliance were identified in four of the areas, one item was found in one area (level 5, failure to follow procedures, Detail 6).

Details

1. Persons Contacted

Baltimore Gas and Electric Company

M. Bowman, Nuclear Engineer
J. T. Carroll, Operations Supervisor
J. A. Mihalcik, Nuclear Engineer
*L. B. Russell, Plant Superintendent

The inspector also interviewed other licensee employees, as well as employees of Combustion Engineering.

Other Accompanying NRC Personnel

R. Architzel, Senior Resident Inspector
*C. Callahan, Resident Inspector

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (50-318/79-01-01): Tagout Log Not Current. A random sampling of locked valves and tagged valves in the Turbine Building and Auxiliary Building was conducted to verify conformance with procedure CCI-112B, Safety and Safety Tagging, 7/17/78. Several valves associated with tagout numbers 87440, 87442, and 87457 were carried as active tagouts in the log, but were not tagged in the field. At the time, it was noted that the licensee had initiated a program to correct such discrepancies.

Procedure CCI-112B has since been revised (change 3, 12/24/80). During a unit shutdown, a single reactor operator is assigned the system lockout and tagout duties for each shift, which includes upkeep of the Unit 1 and Unit 2 operations tagout logs. The inspector reviewed these logs and discussed the current tagout status with the assigned reactor operator. Checks were conducted in the field and in the control room for compliance with tagout No. 1334, Safety Injection Leakoff to Reactor Water Tank. No discrepancies were identified by the inspector. This item is closed.

3. Fuel Handling Operations - Unit 2

Scope

Three shifts of refueling operations, including parts of a 4-12 and 12-8 backshift, were observed by the inspector in both the control room and the fuel floor. Direct observations of the ongoing activities were made to verify that:

-- Refueling crew makeup was as required (TS 6.2.2);

-- Shutdown boron concentration exceeded minimum requirements (TS 3.1.2.7 and 3.9.1);

-- Flux monitoring in the control room with an audible indication on the fuel floor was consistent with procedures (TS 3.9.2);

-- Dedicated communications between control room personnel, the refueling machine operator, and the spent fuel pool were maintained (TS 3.9.5);

-- Fuel floor housekeeping was acceptable, with loose parts controlled;

-- Containment integrity was maintained (TS 3.9.4);

-- Water level was greater than 23 feet above the top of irradiated fuel assemblies seated in the reactor pressure vessel (TS 3.9.10);

-- Refueling machine interlocks were tested (TS 3.9.6);

-- Shutdown cooling was in operation with a flow rate $\geq$ 3000 gpm (TS 3.9.8);

-- Fuel accountability was in accordance with procedures; and,

-- Shift turnovers were conducted per administrative procedures.

Findings

a. Boron Concentration

Technical Specification 3.9.1 requires a shutdown boron concentration sufficient to ensure either (1) a $k_{eff} \leq 0.95$ or (2) a minimum concentration of 1720 ppm; for whichever condition is the more restrictive. This calculation was determined to be 2100 ppm by licensee procedure NEP-4, Rev. 2, Unit 2 Refueling Boron Concentration, Attachment NEP 4-13. Critical refueling boron concentration and refueling inverse boron worth (ppm/$\%\Delta\rho$) values used in NEP-4 calculation were provided by the fuel vendor, Combustion Engineering, in a letter to Baltimore Gas and Electric, document number 9676-524, dated 12/30/80, for the third refueling outage of Unit 2. The inspector held discussions with control room personnel, and reviewed sections of FH-6, Core Reloading Procedures, Rev. 6 for 1/28-29/81, to verify that minimum concentration requirements were met. No discrepancies were identified.

b. Reactivity Control Systems

Through discussions with licensee representatives and review of control room panels and controls, the inspector verified that the limiting conditions of operation for the refueling mode (mode 6) were met in that:

(1) High Pressure Safety Injection Pump No. 23 provided a flow path from the refueling water tank to the Reactor Coolant System (TS 3.1.2.1).

(2) The refueling water tank provided a borated water source that met volume, concentration and temperature requirements (TS 3.1.2.7).

No items of noncompliance were identified.

c. Inverse Multiplication (1/M)

During the fuel loading, the inspector reviewed the sections of Fuel Handling Procedure FH-6 (Rev. 6) that dealt with neutron flux monitoring. Observations of data being taken and 1/M computations being made were conducted on 1/28/81 to verify procedure adherence. Independent 1/M calculations were also made by the inspector as a check on the licensee's calculations. No discrepancies were identified.

4. Startup Testing - Unit 1

Scope

Sections of the licensee's Startup Testing Program were reviewed to verify that the tests were performed in accordance with technically adequate and approved procedures and Technical Specification requirements. Test data were also reviewed to verify that the results meet acceptance criteria.

Findings

The inspector reviewed Post-Startup Test Procedure (PSTP)-2, Unit 1, Cycle 5, Initial approach to Criticality and Low Power Physics Testing, Rev. 1. Data and acceptance criteria were compared for:

(1) Critical boron (ARO, 532^{o}F)

(2) Isothermal Temperature Coefficient

(3) CEA Group Worths

(4) Critical boron (532°F; 5, 4, 3, 2, 1, Full Inserted)

Each was within its defined specifications.

Technical Specification 3.1.1.1 requires that the shutdown margin shall be determined to be $\geq$ 4.3% $\Delta\rho$ before exceeding 5% of rated thermal power. The licensee successfully demonstrated this by meeting the above acceptance criteria parameters of procedure PSTP-2, that were presented in the following Baltimore Gas and Electric documents prepared by Combustion Engineering:

1. BG&E-9676-468, 10/17/80, "Calvert Cliffs Unit 1 Cycle 5 HZP Critical Boron Concentration".

2. BG&E-9676-452, "Calvert Cliffs Unit 1 Cycle 5 Licensee Submittal".

The inspector notes that Baltimore Gas and Electric is to submit a summary report of plant startup and power escalation testing following modifications of the plant due to the new core design. Pending NRC review of this startup report, the inspector has no further questions at this time.

5. IE Circulars

IEC: 80-17, Fuel Pin Damage Due to Water Jet From Baffle Plate Corner, was issued July 23, 1980. This circular identified a fuel pin failure mechanism that has appeared only in certain Westinghouse PWR's. However, it has been distributed to all PWR's since there may be other plant specific designs of the 'as built' core baffle that could contribute to similar fuel pin failures. Recommended actions included (1) determination of core locations that might be subject to water jet impingement upon fuel pins that could potentially be damaged by fretting, (2) examination of fuel pins that were discharged from those locations, or are now at those locations (during the next refueling outage), and (3) take appropriate actions to correct/prevent occurrence of this problem.

The inspector discussed these problems with licensee representatives. These representatives stated that to date, there has been no observed fuel pin damage due to water impingement. Selected fuel assemblies have been discharged and inspected for this specific phenomena during past refuelings, with negative results. The licensee further stated that the fuel vendor, Combustion Engineering, had been contacted when the circular was issued. The fuel vendor indicated to the licensee that fuel pin damage of the kind addressed by the circular had not occurred at any of the C-E plants. When the inspector requested documentation of the licensee - fuel vendor discussions, the licensee's representative stated that they would request a written letter from Combustion Engineering. Based on these discussions, Circular No. 80-17 is closed.

6. Lifted Wires and Temporary Jumpers

Scope

The inspector reviewed procedure CCI-117A, Lifted Wire and Temporary Jumper Log, approved 12/23/80. This procedure superseded CCI-117, and requires an independent verification by a second person or a functional test to conclusively prove the proper installation or removal of the lifted wire or temporary jumper.

Findings

The inspector audited both Unit 1 and Unit 2 Lifted Wire or Temporary Jumper log books located in the shift supervisor's office. Both log books contained an out of date copy of CCI-117. The shift supervisor ordered these copies replaced with the current revision, CCI-117A.

Inspection of the logs identified a number of jumpers that have been in place for several years. A sampling inspection of several of these identified the Steam Lines Drain #4 (Unit 1), serial No. 76-8, had been installed on 1/23/76 and the jumper removed on 1/16/81, after CCI-117 had been revised to require an independent verification of removal. No evidence existed that this jumper was removed in accordance with the new procedure and that the second verification was conducted. The inspector stated concern regarding the other jumpers that predated the new procedure. The licensee's representative acknowledged this concern.

Failure to follow the current Lifted Wire and Temporary Jumper Log procedure, CCI-117A, is an item of noncompliance (50-317/81-03-01).

7. Facility Tours

The inspector conducted several tours of the Turbine and Auxiliary Buildings during all three shifts to observe radiation monitoring and control practices, shift manning, general housekeeping, use of fire barriers and fire watches during welding, and compliance with technical specifications. No items of noncompliance were observed.

8. Exit Interview

The inspection scope and findings were presented to the licensee management (denoted in Detail 1) at the end of this inspection.