

DCS Nos. 50317830630 50318830622  
830707 830623  
830803 830803  
830804

U. S. NUCLEAR REGULATORY COMMISSION  
Region I

Docket/Report: 50-317/83-18 License: DPR-53  
50-318/83-18 DPR-69

Licensee: Baltimore Gas and Electric Company

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

Inspection At: Lusby, Maryland

Dates: July 12 - August 9, 1983

Submitted:

*E. M. Kelly*  
for R. E. Architzel, Sr. Resident Inspector

*8/11/83*  
date

*E. M. Kelly*  
for D. C. Trimble, Resident Inspector

*8/11/83*  
date

Approved:

*Edward J. Neumann*  
Edward J. Neumann  
Acting Chief,  
Reactor Projects Section 1A

*8/26/83*  
date

Summary:

July 12 - August 9, 1983: Inspection Report 50-317/83-18, 50-318/83-18.  
Areas Inspected: Routine resident inspection (104 hours) of the control room, accessible parts of plant structures, plant operations, radiation protection, physical security, fire protection, plant operating records, maintenance, surveillance, radioactive effluent and sampling programs, open items, and reports to the NRC. No violations were found.

## DETAILS

### 1. Persons Contacted

The following technical and supervisory personnel were contacted:

- J. T. Carroll, General Supervisor, Operations
- J. T. Carlson, Supervisor, Radiation Safety
- S. E. Cherry, Principal Chemistry Technician
- J. A. Crunkleton, Supervisor, Electrical Maintenance
- R. E. Denton General Supervisor, Training/Technical Services
- C. L. Dunkerly, Shift Supervisor
- J. E. Gilbert, Shift Supervisor
- S. Hager, Site Representative, Combustion Engineering
- R. P. Heibel, Principal Engineer, Technical Support
- D. W. Latham, Principal Engineer, OL&S Unit
- J. F. Lohr, Shift Supervisor
- A. E. Lundvall, Jr., Vice President, Supply
- J. A. Mihalcik, Principal Engineer, Fuel Cycle Management
- N. L. Millis, General Supervisor, Radiation Safety
- J. M. Moreira, General Supervisor, Electrical & Controls
- J. E. Rivera, Shift Supervisor
- L. B. Russell, Plant Superintendent
- J. A. Tiernan, Manager, Nuclear Power Department
- R. L. Wenderlich, Supervisor - Operations Quality Assurance Auditing
- D. F. Zyriek, Shift Supervisor

Other licensee employees were also contacted.

### 2. Licensee Action on Previous Inspection Findings

(Closed) No Maintenance Request Tracking System for Shift Supervisor (317/82-01-46). The NRC's Performance Appraisal Team noted as a weakness that no tracking system was available for the Shift Supervisor to follow the status of all maintenance requests. The licensee has initiated a computerized Maintenance Tracking System which provides current status for all maintenance actions.

(Closed) Unresolved Item (317/82-23-02) Design Requirements of Service Water Pump Room Regarding Water Tight Integrity. A September 13, 1982, Electric Engineering Department memorandum stated that the two core bores noted by the inspector were both above the 18 foot elevation and that the water tight integrity of the subject wall extends only up to the 18 foot elevation. Therefore, a water tight seal for the two core bores was not required.

(Closed) Unresolved Item (317/82-07-09) Poor Communications During Watch Turnover Resulting in a Delay in Clearance of a Component Cooling Heat Exchanger Tagout. The General Supervisor, Operations (GS-0) stated that he had discussed the event with each watch section to remind them of their responsibility of being cognizant of plant status.

(Closed) Inspector Follow Item (317/82-23-07) Delay in Reporting Results of Release Calculation to the Shift Supervisor. The inspector discussed this item with the GS-0. The GS-0 pointed out that since the August 24, 1982 release, results of release calculations are being promptly reported to the Shift Supervisors by the Radiological Assessment Directors. Additionally, the GS-0 stated that he had discussed the incident with all Shift Supervisors to help prevent future occurrences. The reporting delay appears to be an isolated case.

(Open) Unresolved Item (317/82-26-02) Revise Procedures to Address Actions Following an Earthquake. On August 3, 1983, the inspector reviewed ERPIP's 3.4, Revision 9, (regarding Natural Events) and 3.1, through Change to Revision 9, (Initial Actions and Emergency Classification Levels) and the Senior Control Room Operator's copy of OI 46, including Calvert Cliffs Operating Manual (CCOM) Change 82-13, (Seismic Measurement Equipment) for possible close out of unresolved item 317/82-26-02.

During the review, the inspector found that CCOM Change 82-13 to OI 46 had not been properly implemented in that the licensee had no record conclusively showing that the change had been approved by appropriate members of the plant staff or the POSRC. The change had been distributed to all control room sets of operating manuals; a tentative indication that the temporary change had been properly initiated (with required initial approvals). The purpose of the change was administrative in nature, changing the terminology "Safe Shutdown Earthquake" to "Design Basis Earthquake" so that the terminology would be consistent with the FSAR (values still the same). The change also made the OI actions consistent for an Operating Basis or Design Basis Earthquake with those required by the Emergency Response Plan. The Change Report had apparently subsequently been lost so that final review and approval was not performed. OI 46 addresses plant actions to be taken following an earthquake event (i.e., shutdown the plant in the case of a Design Basis Earthquake). A temporary change to a procedure of this nature requires (TS 6.8.3) the approval of two members of the plant staff (one of whom must hold a Senior Reactor Operator license), the POSRC, and the Plant Superintendent within 14 days of implementation. Records of such changes must be retained for 5 years (TS 6.10.1).

CCOM Change Report 83-164 was initiated on August 3, 1983, to correct the documentation and obtain required reviews and approvals.

The licensee noted that corrective action to preclude recurrence was already in place. The inspector reviewed Calvert Cliffs Instruction 300F, Calvert Cliffs Operating Manual. Change 7, initiated August 4, 1983, changed the flow path for implementation of CCOM Change Reports to require implementation by the Operations Clerk. As such, two sets of indexes are presently maintained, and the Operations Clerk would immediately note a missing sequential number in the index. The inspector questioned the licensee regarding the possible existence of other CCOM changes which had not received proper review and approval. The licensee committed to page check one controlled Operating Manual within 30 days and ensure that all CCOM changes were properly documented and reviewed.

The inspector noted that this appeared to be an isolated case of failure to control a temporary procedure change for which adequate corrective action was taken and planned. This item is unresolved pending completion of the licensee's review (317/83-18-01).

### 3. Review of Plant Operations

#### a. Daily Inspection

During routine facility tours, the following were checked: manning, access control, adherence to procedures and LCO's, instrumentation, recorder traces, protective systems, control rod positions, Containment temperature and pressure, control room annunciators, radiation monitors, radiation monitoring, emergency power source operability, control room logs, shift supervisor logs, tagout logs, and operating orders.

No unacceptable conditions were identified.

#### b. Weekly System Alignment Inspection

Operating confirmation was made of selected piping system trains. Accessible valve positions and status were examined. Power supply and breaker alignment was checked. Visual inspections of major components were performed. Operability of instruments essential to system performance was assessed. The following systems were checked:

--Reserve battery alignment to #11 125 Vdc bus checked on July 13, 1983.

--Unit 1 Auxiliary Feedwater System checked on July 21, 1983.

--Unit 1 and 2 MSIV Accumulators checked on July 29, 1983.

--Containment Isolation Valves in the Unit 1 27' West Piping Penetration Room checked on August 3, 1983.

No unacceptable conditions were identified.

c. Biweekly Inspection

During plant tours, the inspector observed shift turnovers; boric acid tank samples and tank levels were compared to the Technical Specifications; and the use of radiation work permits and Health Physics procedures were reviewed. Area radiation and air monitor use and operational status was reviewed. Plant housekeeping and cleanliness were evaluated. Verification of the following tagouts indicated the action was properly conducted.

--Tagout 809, Low Voltage Permit, Removal of #11 battery from service, checked on July 13, 1983.

--Tagout 3434-1, Unit 1 #13 AFW pump dated July 16, 1983, checked on July 21, 1983.

--Tagout 6051, Unit 2 Condenser Off Gas Pump, checked on August 1, 1983.

Records and sample results of the following activities were reviewed to verify conformance with regulatory requirements.

--Gaseous Release Permit G-102-83, Release of Waste Gas Decay Tank #12, released on July 29, 1983.

--Liquid Waste Release Permit M-109-83, Release of Miscellaneous Waste Monitor Tank, released on July 30, 1983.

--Liquid Waste Release Permit R-105-83, Release of #12 Reactor Coolant Waste Monitor Tank, released on July 22, 1983.

The inspector also reviewed the Radiological Controls Shift Supervisor Logs, Radiological Controls 69' and Auxiliary Building Logs, Counting Room Daily Work Sheets, and Primary and Secondary Sampling Program results for the month of July. The inspector reviewed counting room records for July and August to check that grab samples had been taken at the required five times per week frequency for the Unit 2 Condenser Off Gas Monitor (out of service since July 10, 1983, MR 0-83-4728) and the Unit 2 Main Vent Charcoal and Particulate Monitor (out of service since May 24, 1983, MR 0-83-4392).

No unacceptable conditions were identified.

d. Other Checks

--At 10:48 a.m. on July 18, 1983, a Radiological Event was declared when the licensee noted an increase in the Unit 2 Waste Processing Ventilation Monitor Reading. The Unit 2 Main Vent Gaseous Monitor was observed to

increase from a normal background of about 100 counts per minute (cpm) to about 300 cpm peak. The licensee determined that the cause of the increase in Auxiliary Building radiogas activity was filling of the Unit 2 degassifier reference legs. The inspector observed the licensee's implementation of the Radiological Event implementing procedures and examined monitoring and Control Room activities and recorder indications. The licensee secured from the event about 11:30 a.m. following receipt of confirmatory samples showing background levels in the Auxiliary Building.

No unacceptable conditions were identified.

#### 4. Observation of Physical Security

Checks were made to determine whether security conditions met regulatory requirements, the physical security plan, and approved procedures. Those checks included security staffing, protected and vital area barriers, vehicle searches, and personnel identification, access control, badging, and compensatory measures when required.

No unacceptable conditions were identified.

#### 5. Review of Licensee Event Reports (LER's)

a. LER's submitted to NRC:RI were reviewed to verify that the details were clearly reported, including accuracy of the description of cause and adequacy of corrective action. The inspector determined whether further information was required from the licensee, whether generic implications were indicated, and whether the event warranted onsite followup. The following LER's were reviewed.

<u>LER No.</u>	<u>Event Date</u>	<u>Report Date</u>	<u>Subject</u>
<u>Unit 1</u>			
83-33	6/30/83	7/29/83	Boric Acid Concentration in #11 and #12 BAST exceeded limits of TS
83-38	7/07/83	8/04/83	#12 Auxiliary Feedwater Pump Inoperable
83-41	8/03/83	8/04/83	ECCS Pump Room Exhaust Ventilation System Inoperable
83-43	8/04/83	8/05/83	Loss of CEA Reed Switch Position Indication Channels
<u>Unit 2</u>			
83-34	6/22/83	7/21/83	Containment Atmosphere Particulate Radioactivity Monitoring System Inoperable

83-35	6/23/83	7/21/83	Main Steam Supply Valve to Steam Driven AFW Pumps Failed Open causing #21 AFW Pump to start
83-37	8/03/83	8/04/83	ECCS Pump Room Exhaust Ventilation Systems Inoperable

b. For the LER's selected for onsite review, the inspector verified that appropriate corrective action was taken or responsibility assigned and that continued operation of the facility was conducted in accordance with Technical Specifications and did not constitute an unreviewed safety question as defined in 10 CFR 50.59. Report accuracy, compliance with current reporting requirements and applicability to other site systems and components were also reviewed.

--83-43(U1) About 1:15 p.m. on August 4, 1983, the reed switch position indications for all Control Element Assemblies (CEA's) became inoperable. Upper Electrical Limit and pulse counting indications for all CEA's remained operable. At about 1:45 p.m., before plant shutdown (required by TS 3.0.3) was initiated, the problem was isolated to a short in the reed switch assembly for CEA 32 in Group 3. The unit continued operating in TS action statement 3.1.3.3.c for CEA's 18, 56, and 32. As noted in Inspection Report 317/83-16, the failures in these three CEA indication channels are similar and may have been caused by a manufacturing defect.

Defects of this nature may exist in all reed switch assemblies installed on both units. This LER remains open pending receipt of the written report and evaluation of permanent corrective action.

--83-41(U1) and 83-37(U2) At 1730 on August 3, 1983, during surveillance tests with the units at 100% power, it was discovered that the Unit 2 ECCS Pump Room Exhaust Ventilation System charcoal filter inlet damper would not open when the filters bypass damper was shut. Subsequently, an identical condition was determined to exist on Unit 1. The charcoal filter inlet dampers on both units were secured in their open position restoring the systems to operable status.

The inspector reviewed the most recently performed Surveillance Tests (STP M-547) for flow determination of the ECCS Pump Room Exhaust Filters. Unit 2 testing on August 4, 1982, demonstrated a flow rate greater than 3000 Standard Cubic Feet per minute (SCFM) with a filter efficiency of 99.91% for removal of a test gas (freon). The latest testing for Unit 1, performed on August 25, 1982, showed 2730 SCFM with a 99.96% efficiency. Technical Specifications require a flow rate of 3000 SCFM +/- 10%.

The cause of the maloperation of the charcoal filter inlet damper was apparently improper installation of the damper's actuator. As indicated on P&ID M-64 and Electrical Schematic IE-85 Sheet 7B the damper actuators (1-PO-5408, 3 and 4) is supposed to be an air to shut, fail open damper.

The solenoid valve, SV-5408 is energized to close. The electrical control was therefore correct, however, the actuator was causing the damper to respond backwards (Charcoal Filter inlet damper closed in the filter position, open in the bypass position). The improper damper installation did not result in a total loss of air flow due to air leakage through the dampers in the closed position, as evidenced by successful surveillance test results.

Although the operation of the Unit 2 damper was the same, investigation found that one damper actuator was not connected and the redundant actuator had a loose set screw, such that the damper was simply passing air flow as needed.

Testing of air flow on August 3, (#11 ECCS Pump Room Exhaust Fan) using a herculite cover over the charcoal filter, resulted in essentially no air flow through the fan. When the herculite was removed and the supply damper cycled open and closed, significant air flow was again measured through the system. This testing (MR I-83-4003) was observed by the inspector.

Because the charcoal supply damper had been routinely opened during the time the control switch was in the "bypass" position the licensee agreed to consider that the Unit 1 charcoal absorber had been in operation greater than 720 hours and perform the required carbon sample testing. (The purpose of the initial testing being performed on Unit 2 was to verify proper operation following removal of a charcoal sample, which is to be measured for efficiency). The licensee stated that the majority of

the air flow under bypass conditions would pass through the open bypass valves, as opposed to the charcoal filter, which would provide a flow resistance. Additional licensee actions regarding this event will be reviewed following receipt of the followup report. This LER remains open.

## 6. Plant Maintenance

The inspector observed and reviewed maintenance and problem investigation activities to verify compliance with regulations, administrative and maintenance procedures, codes and standards, proper QA/QC involvement, safety tag use, equipment alignment, jumper use, personnel qualifications, radiological controls for worker protection, fire protection, retest requirements, and reportability per Technical Specifications. The following activities were included.

--MR E-83-318, Fire Protection Modification to provide local control of the Unit 2 Salt Water Pump #23, observed on July 14, 1983.

--MR M-83-2236, Bulleting of #21 Service Water Heat Exchanger, PM #2-12-M-Q-1, observed on August 4, 1983.

--M-82-6213, Shield Wall Penetration for AFW Piping (FCR 79-1062), observed on August 1, 1983.

No unacceptable conditions were identified.

#### 7. Surveillance Testing

The inspector observed parts of tests to assess performance in accordance with approved procedures and LCO's, test results (if completed), removal and restoration of equipment, and deficiency review and resolution. The following tests were reviewed:

--STP M-225-2, Unit 2 Auxiliary Feedwater Actuation System Functional Test, observed on July 14, 1983.

--STP M-210-B-1, Reactor Protective System Functional Test, observed on August 2 and 3, 1983.

--MR I-83-4003, Flow Testing of ECCS Pump Room Exhaust Fan #11, observed on August 8, 1983.

No unacceptable conditions were identified.

#### 8. IE Bulletin Followup

The inspector reviewed licensee actions on the following IE Bulletin to determine that the written response was submitted within the required time period, that the response included the information required including adequate corrective action commitments, and that licensee

management had forwarded copies of the response to responsible onsite management. The review included discussions with licensee personnel and observations and review of items discussed below.

--IEB 83-04 Failure of UV Trip Function of the Reactor Trip Breakers. As a followup the licensee decided to conduct monthly tests of the UV trip devices. On June 29, 1983, the POSRC approved a new Surveillance Test Procedure (STP M-200-1) to accomplish this testing. The STP was first conducted on Unit 1 on July 18, 1983, and on Unit 2 on July 19, 1983. Precise trip times were not measured since the licensee was simply verifying UV trip action. Nonetheless, two breakers on Unit 1 exhibited sluggish behavior. Breaker #4 tripped after about a 9 second delay. Breaker #3 tripped at something greater than the required response time of 200 msec. Two Unit 2 breakers (#4 and #7) also exhibited sluggish response times; on the order of 1 to 1.5 seconds. The four breakers noted above were removed and taken to the shop. Checks were made of the undervoltage trip relay pickup, dropout and positive trip travel settings, trip shaft torque, butter paddle rightness, latch engagement,

and undervoltage relay armature clearance. Out of tolerance settings were corrected, and all four breakers were retested for UV trip times in the shop. All four breakers tripped at 40 msec. On July 21, 1983, the inspector asked the licensee to time the UV trips of the remaining 12 Reactor Trip Breakers and to time all breaker UV trips on future monthly tests. The Acting Plant Superintendent committed to time the monthly breaker UV trips until the problem with slow response times is corrected. The remaining 12 breakers were trip time tested in the shop during the week of July 25, 1983. All trip times but one were less than the procedurally specified 200 msec. Unit 1 breaker #2 tripped at 400 msec. The settings noted above were checked and, if necessary, adjusted for each of the remaining 12 breakers. Following adjustments, all breakers tripped in less than 52 msec.

9. ECCS Pump Room Exhaust Air Filtration System

On July 18, 1983, the licensee informed the inspector that the discharge dampers for the Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Filtration System would fail closed (rendering the room exhaust system inoperable) should a Loss of Coolant Accident (an event during which the system was designed for use in exhaust air filtration) occur in conjunction with a loss of offsite power. The dampers would close due to an expected loss of Instrument Air (IA). The IA would not be available because:

1. The Service Water Cooling supply to the affected unit's IA compressor would be isolated upon initiation of a Safety Injection Actuation Signal (SIAS); and
2. The Plant Air System (Units 1 and 2 cross-connected) would not be available to automatically resupply the IA system due to the unavailability of electric power Plant Air compressors.

The licensee stated they had performed an evaluation and concluded that none of the accident analyses in the Final Safety Analysis Report (FSAR) required operation of the system to reduce offsite doses, the system meets applicable design criteria, and that the basis of the ECCS Pump Room Exhaust Air Filtration System TS is incorrect in stating that the operation of the system and the resultant effect on offsite dose calculations was assumed in the safety analysis. Based upon the above evaluation, the licensee had determined that the ECCS Pump Room Exhaust Air Filtration System was still operable.

The inspector reviewed the licensee's evaluation and applicable FSAR safety analyses. The inspector pointed out to the Acting Plant Superintendent that the analysis for the Maximum Hypothetical Accident

(FSAR Section 14.24) assumed only two fission product leakage paths from Containment - leakage directly from the building to atmosphere and leakage to the penetration rooms. The analyses did not address fission product leakage into the ECCS Pump Rooms during coolant recirculation. The inspector stated that this third leakage path may not have been addressed because of an unstated assumption that the ECCS Pump Room Exhaust Air Filtration System would be in operation removing fission product activity before room exhaust air reached the plant vent.

On July 21, 1983, the Acting Plant Superintendent stated that they will provide interim and final corrective actions to assure operability of the ECCS Pump Room Exhaust Air Filtration System during a LOCA event concurrent with a loss of offsite power. The interim corrective action were procedural in nature and directed operations personnel to restore IA to the affected unit by:

1. Cross-connecting IA from the unaffected unit to the affected unit to provide air for reopening the Service Water Cooling Supply valves to the Turbine Building loads (including the IA compressor); and
2. Restarting of the affected unit's IA compressor.

The licensee committed to propose a final hardware change and schedule for completion to NRR. On August 1, 1983, the Plant Superintendent committed to conduct an evaluation to verify that a loss of IA will not cause other unanticipated failures of safety related systems.

Implementation of final corrective action(s) for the ECCS Pump Room Exhaust Air Filtration System and licensee completion of their evaluation for possible safety related system failures due to loss of IA and resolution of the Technical Specification bases by the licensee is considered unresolved. (317/83-18-02).

#### 10. Review of Periodic and Special Reports

Upon receipt, periodic and special reports submitted pursuant to Technical Specification 6.9.1 and 6.9.2 were reviewed. That review included the following: Inclusion of information required by the NRC, test results and/or supporting information, consistency with design predictions and performance specifications, planned corrective action adequacy for resolution of problems, determination whether any information should be classified as an abnormal occurrence, and validity of reported information. The following periodic report was reviewed:

--June, 1983 Operations Status Reports for Calvert Cliffs No. 1 Unit and Calvert Cliffs No. 2 Unit, dated July 15, 1983.

No unacceptable conditions were identified.

11. Unresolved Items

An Unresolved Item requires more information to determine acceptability and is discussed in Detail 2.

12. Exit Interview

Meetings were periodically held with senior facility management to discuss the inspection scope and findings. A summary of findings was presented to the licensee at the end of the inspection. No written material was provided to the licensee during the preparation of this report.