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U. S. NUCLEAR REGULATORY COMMISSION

Region I

Docket/Report: 50-317/84-19
50-318/84-19

License: DPR-53
DPR-69

Licensee: Baltimore Gas and Electric Company

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

Inspection At: Lusby, Maryland

Dates: July 11 - August 20, 1984

Inspectors: A Luptak for I. Foley, Senior Resident Inspector — 9/28/84 date

A Luptak for D. C. Trimble, Resident Inspector — 9/28/84 date

Approved: T. C. Elsasser — 9/28/84 date
T. C. Elsasser, Chief, Reactor Projects Section 3C

Summary:
July 11 - August 20, 1984: Inspection Report 50-317/84-19, 50-318/84-19.

Areas Inspected: Routine resident inspection (161 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 sampling program, open items, and reports to the NRC. One violation was found: Failure to Provide Adequate Test Procedure for Verifying Proper Operation of Components Which Automatically Actuate on High Radiation.

DETAILS

1. Persons Contacted

Within this report period, interviews and discussions were conducted with various licensee personnel, including reactor operators, maintenance and surveillance technicians and the licensee's management staff.

2. Licensee Action on Previous Inspection Findings

(Closed) Inspector Follow Item (317/82-23-06) Confirm Licensee Properly Implementing the Requirements of Calvert Cliffs Instruction CCI 140 Regarding Limits of Operations Personnel Overtime. The inspector performed a sampling review of the work schedule sheets for licensed operators from April 1984 to June 1984 which included the recent Unit 2 refueling outage period. The requirements of the overtime policy of CCI 140D dated March 9, 1984 are being adhered to. Where extenuating circumstances exist, authorization for additional overtime can be granted by the Plant Superintendent or the General Supervisors. The inspector reviewed the file of these authorizations to confirm that excess overtime is being properly authorized and documented. No deficiencies were identified.

(Closed) Violation (317/83-13-01) Failure to Procedurally Control the Positions of Five Skid Mounted Component Cooling Water (CCW) Supply Valves on Each Unit 1 High Pressure Safety Injection (HPSI) Pump. At the time of the violation one of the valves (Seal Circulation Cooler Supply) for #12 HPSI pump was found inappropriately closed. The CCW valves associated with the Unit 1 HPSI pumps did not have identification numbers assigned to them on the Operation and Maintenance (OM) diagram nor were they included on the CCW system valve lineup sheet. Upon discovery of the closed valve, the licensee immediately repositioned the valve and verified that all the CCW valves associated with the HPSI pumps on both units were properly positioned. Since that time the OM diagrams (OM 51, Sheet 1 of 3, Revision 11 dated July 9, 1984 for Unit 1, OM 452, Sheet 1 of 3, Revision 13 dated July 9, 1984 for Unit 2) were revised to assign identification numbers to the valves. The valve lineup sheets in Operating Instruction OI-16 for both units have been revised to include these valves (OI-16, Revision 17 dated July 19, 1984 for Unit 1; OI-16, Revision 14 dated April 18, 1984 for Unit 2).

(Closed) Unresolved Item (317/82-03-02) Establish Planned Maintenance (PM) to Check the Zero Point of Main Vent Manometers. This item was also discussed in Section 2 of Inspection Report 317/83-05, 318/83-05. The licensee has established quarterly (1-32-I-Q-8) and refueling (1-32-I-RQ1-9) PM's which check the zero point for these manometers.

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.

b. 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:

-- Unit 2 Containment Purge checked on July 23, 1984.

-- Units 1 and 2 Control Room Ventilation.*

-- Unit 1 Auxiliary Feed Pump System.

*For this system, the following items were reviewed: The licensee's system lineup procedure(s); equipment conditions/items that might degrade system performance (hangers, supports, housekeeping, etc.); instrumentation lineup and operability; and valve position/locking (where required) and position indication, and availability of valve operator power supply.

ESF Walkdown

During this period, the Control Room and Cable Spreading Room Ventilation System was inspected.

System Description

The description of the Control Room and Cable Spreading Rooms Ventilation System is contained in a document entitled, "Auxiliary Building Ventilation System", System Description No. 43B, January 1984". Except for several minor errors concerning terminology and damper identification, this system description adequately describes the function of the system under normal and accident conditions. A representative of the licensee committed to correct these errors.

Operating Instruction

Operating Instruction OI-22F, Revision 8, "Control Room and Cable Spreading Rooms Ventilation was reviewed. An error was determined to exist in Section IX and X in that HS-5359 is not manually actuated when placing the ventilation system in the recirculation mode. A representative of the licensee committed to correct this error.

The valve/damper alignment specified in Attachment (1) to OI-22F was compared with the actual system alignment and was found to be satisfactory. It was determined that several valve identification tags were incorrect. A representative of the licensee committed to replace the above incorrectly labeled valve tags.

During the course of inspecting the system components it was noted that housekeeping in the general area of the 69 foot level was unacceptable. Excessive tools, trash, dust and miscellaneous debris were accumulating in the area of the Control Room ventilation fans. Although considerable construction was noted on the 69 foot level of the Turbine Building, no attempt was evident to safeguard the system from construction debris. Upon being informed of this situation the licensee took prompt action to clean and isolate the area from the construction activity.

A subsequent inspection indicated that areas on the 69 foot level, where safety-related equipment is located, had been properly cleaned and were being maintained in an orderly fashion.

Surveillance Test Procedures (STPs)

The following STPs, associated with the testing of the Control Room and Cable Spreading Rooms Ventilation System were reviewed:

-- STP-O-7-2, Revision 32, "ESF Logic and Performance Test"
-- STP-O-97-O, Revision O, "Control Room Emergency Ventilation Test"
-- STP-O-72-O, Revision 1, "Control Room High Radiation Functional Test"
-- STP-M-541-O, Revision 3, "Control Room Post LOCI Exhaust System Charcoal Filter Test"
-- STP-M-540-O, Revision 3, "Control Room Post LOCI Filter Test (HEPA)"

During the review of the above STPs it was determined that STP-O-72-O was significantly deficient in that most of the components necessary for achieving Control Room isolation and recirculation were not tested under this STP. TS 4.7.6.1e(2) requires a verification that on a high radiation signal, the system switches to a recirculation mode of operation and that the isolation valves close. STP-O-72-O, Revision 1 appears inadequate in that isolation valves H VAC-101 and H VAC-5370 are not verified to close, and valves H VAC-5352 and 5353 are not verified to open (for recirculation). 10 CFR 50 Appendix B Criterion V, "Instructions, Procedures and Drawings" requires that activities affecting quality be prescribed by procedures appropriate to the circumstances and shall include appropriate acceptance criteria for determining that the activity has been satisfactorily accomplished. Contrary to this, STP-O-72-O is not appropriate to the circumstances nor does it contain acceptance criteria that demonstrate that the procedure has been satisfactorily completed in that it does not verify proper recirculation or verify that all Control Room isolation valves close. This is a violation (317/84-19-01).

The licensee subsequently revised STP-O-72-O and performed such successfully. This completed revision was reviewed and found to be acceptable. The inspector questioned the licensee regarding the adequacy of other Surveillance Test Procedures and the adequacy of the periodic reviews performed on surveillance procedures as required by TS 6.8.2.

The licensee stated that Quality Assurance has recently completed four of five modules of an audit of surveillance procedures which examine the adequacy of surveillance procedures, however, the STP on Control Room ventilation was not among the completed audits. The completion of the review is scheduled for November 1984. The licensee stated that they would examine their procedure review process. Upon completion, the inspector will review the results (317/84-19-03).

A second, minor deficiency, associated with STP-M-541-O, was also identified. This STP does not require that charcoal "absorber" samples be thoroughly mixed in accordance with TS 4.7.6.1. Representatives of the licensee committed to revising STP-O-72-O prior to the next charcoal test.

Technical Specifications

Review of the STPs referenced above indicated that the licensee meets the minimum requirements for surveillance testing pursuant to TS 3/4.7.6, "Control Room Emergency Ventilation System", (except as described in the previous paragraphs). In addition, an audit of complete STPs indicated that the surveillance intervals are in conformance with TS 3/4.7.6.

Storage of Spare Parts

A sample of spare parts, used in the maintenance or repair of the Control Room and Cable Spreading Rooms Ventilation System, were inspected to determine conformance to regulatory requirements for storage of such equipment. The licensee has committed to use ANSI N45.2.2, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants", 1972. The spare parts that were inspected included a compressor, compressor piston rings, belts, valves, dust filters, consumable stores such as compressor oil, and refrigerant.

All items that were inspected were categorized by the licensee as Level B storage as defined in Section 6.1.2.(2) of ANSI N45.2.2. It was noted that one box of dust filters was open with several extra dust filters piled on top of the open carton. The licensee's representatives took prompt action by discarding or reinspecting and sealing the material as appropriate.

Conclusion

The Control Room and Cable Spreading Rooms Ventilation System appeared to be in good condition and in a satisfactory state of readiness concerning its post-accident function. Several procedural problems seem to have existed; however, the licensee was responsive to inspector concerns and provided prompt remedial action when required.

c. Biweekly and Other Inspections

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 tagouts indicated that actions taken were properly conducted.

d. Other Checks

On July 25, 1984, two of the four Unit 2 pressurizer pressure safety channels (channels C and D) were indicating 12-15 psi lower than the pressurizer pressure control program setpoint. These instruments are manufactured by Barton and were installed on Unit 2 during the spring 1984 refueling outage as environmentally qualified replacements for the older Fisher-Portor devices. Because problems with instrument drift had been noted on similar Barton instruments on Unit 1, the licensee was trending the new Unit 2 instruments. Inspection Report 317/83-31, 318/83-31, section 4, describes the Unit 1 instrument drift problem and the licensee's trending program (same trending programs used on both units). The licensee checked instrument calibration and found that channel C (PT 102C) varied by as much as 20 psi from reference value and channel D (PT 102D) varied as much as 17 psi from referenced value. Both C and D were recalibrated on July 25, 1984. Instrument drift appeared to be affected by Containment temperature which had increased by about 8 degrees Fahrenheit during the period of drift. The vendor has indicated that a new model instrument will be available in the fall 1984 which the licensee could install to provide resolution of the problem. Licensee actions to correct the Barton drift problem will continue to be reviewed by the NRC as item No. 317/83-31-01.

4. Review of Events Requiring Prompt Notification to the NRC

The circumstances surrounding the following events requiring prompt NRC notification per 10 CFR 50.72 via the dedicated telephone (ENS-line) were reviewed.

-- At 12:49 p.m. on July 24, 1984 with Unit 1 at 100% power, an inadvertent actuation of the Undervoltage (UV) function of Engineered Safety

Features Actuation System (ESFAS) occurred. The actuation was caused by operator error during the performance of a surveillance test. No water was injected into the Reactor Coolant System. The actuation caused load shedding of vital 4KV bus #14 and opening of its feeder breaker. The bus was quickly reenergized and loads restored. Following the event, operations personnel repeated the test three times to confirm that the procedure was correct and that plant equipment was operating properly. The inspector discussed the event with one of the two operators who conducted the test and their Shift Supervisor and walked through the procedure at the ESFAS panel. The procedure was Surveillance Test Procedure (STP) O-8-B-1, "12 Diesel Generator and 4KV Bus 14 LOCI Sequencer Test" dated June 15, 1984. During the performance of procedure section B (LOCI sequencer testing for the B logic) the operator mistakenly pushed test button UVB-1 instead of UVB-4. He had satisfactorily performed a similar test earlier in procedure. A caution statement in the procedure warns that "depressing a test button on a UVB logic module other than UVB-4 may cause load shedding of vital equipment or loss of power to 4KV bus 14".

-- With Unit 1 at 100% power at 11:30 a.m. on August 8, 1984, the licensee determined that #21 station battery was inoperable due to a high electrolyte level condition in all cells (level was higher than allowed by Technical Specification Surveillance Requirement 4.8.2.3.2.a.1). See Section 8 for details.

5. Observations 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.

6. Review of Licensee Event Reports (LER's)

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 was reviewed.

LER No.	Event Date	Report Date	Subject
Unit 1			
84-06	07/09/84	08/06/84	RCP Seal Bleed Off Line Weld Failure

7. 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.

-- Leak repair on #22 Auxiliary Feedwater Pump Oil Cooler observed on July 27, 1984.

-- Leak repairs on Reactor Coolant Pump Controlled Leak Off Line.

-- Sway Strut Installation on Service Water Piping (MR-84-6145).

During this period a one time inspection of the effectiveness of the licensee's Maintenance Program was performed:

Maintenance Program Review

During this inspection period a special inspection was performed on the maintenance program to determine if: (1) equipment failures are evaluated for frequency and root cause; (2) maintenance errors are detected, evaluated, and corrected including root cause; (3) licensee's record systems are organized to support the above evaluations; and, (4) maintenance practices contribute to system unavailability. Maintenance records for 1983 for Emergency Core Cooling System (ECCS) components (pumps, motors, breakers, flow path valves, instrumentation, controls, and initiation logic) and associated systems' components (emergency electrical, fire protection, Primary (PCC) and Secondary Component Cooling (SCC) Water and service water) were reviewed as were the procedures governing the control of maintenance and maintenance records. Particular attention was given to the occurrence and handling of repeat failures.

The inspector concluded that, except for routine component failures (expected to fail within the life of the plant) and minor maintenance, the licensee makes a consciencious effort to detect, evaluate and determine root causes of failures and correct maintenance problems. The licensee, except for significant failures, does not formally trend nor formally evaluate the frequency of routine equipment failures. Significant failures are trended and evaluated for root cause by formal methods. Licensee records are currently not organized to facilitate trending of routine failures, although data regarding failures is available and could be retrieved by manually searching plant history records. Some trending is achieved via cognizant supervisor recollection and individual (personal) informal programs. The licensee recognizes this inadequacy and has implemented the initial steps of the "Nuclear Information System" and the "Integrated Corrective Action Program" (ICAP), Quality Assurance Procedure QAP-11.

This computerized system is scheduled to be one line in early 1985. Some formal procedures are written and approved which will utilize the system as soon as the system is available. The ICAP program should provide a significant contribution to improving the licensee's PM and corrective maintenance programs, although additional staffing of the program may be necessary as the program evolves for it to be a productive tool.

Details

The inspector reviewed from 1983 a sampling of Licensee Event Reports, Maintenance Requests, Nonconformance Reports, Calvert Cliffs Event Reports, and Preventive Maintenance Cards. A selection of recurring failures was made for which the inspector traced the various licensee processes for resolving maintenance problems. The licensee utilizes three formal systems to evaluate specific maintenance problems and several overall management trend/evaluation programs on site.

The most thorough and comprehensive analysis of component failures occurs when a Calvert Cliffs Event Report is generated. These are required for problems which cause a reduction in power generation or for events deemed to be significant by the Plant Superintendent in accordance with Calvert Cliffs Instruction CCI-127 "Calvert Cliffs Event Report". CCI-127 requires a thorough research of the components history, similar events (through a Nuclear Plant Reliability Data System (NPRDS) and LER search) and a determination of the root cause to preclude recurrence. The event report examines the event for recurring failure modes, equipment problems, possible human engineering improvements, improved maintenance practices, procedure revisions and training improvements. The results are reviewed by the Plant Operations and Safety Review Committee and approved by the Plant Superintendent.

The next most meaningful system used by the licensee is the Quality Assurance Nonconformance Report (NCR). QAP-26 "Control of Conditions Adverse to Quality" requires resolution of all NCR identified problems categorized as level A, B, or C. All Maintenance Requests (MRs) are routed through Quality Assurance. With few exceptions, all safety related MRs have a Quality Control Inspector witnessing the maintenance activity and documented NCRs are generated as required. Level A, B, and C NCRs require responses from applicable departments annotating the root cause of the deficiency. Personnel, procedural and design/installation errors are categorized as Level A or B NCRs and require immediate management attention and resolution. The inspector noted that trending of similar events is not performed except by alert supervisors recollection. Only Level A, B, and C NCRs require responses. Most NCRs reviewed were classified as Level D (components expected to fail during the life of the plant). No evaluation, trend or determination of root cause is performed for the "routine" Level D failures except when the the failure is a recurring problem that alert supervisors recall. Recurring Level D NCRs are upgraded to Level C or higher as necessary until the true root cause is determined and cause corrected.

The least utilized system is the Licensee Event Report (LER) system. Although it is used as a data base for searches, and provides the only available useful trending ability (manual search of the index for similar events), the true root cause analysis and evaluations take place in the Calvert Cliffs Event Report system or as a result of NCRs generated by QC inspectors. The LER system is well organized to support equipment failures, evaluations, trends and root cause analysis; however, the system is perfunctory in nature because it is limited in the overall scope of maintenance problems.

The licensee maintains several onsite management tools in this area. Most of the tools stem from the Baltimore Gas and Electric "Maintenance Management System" (MMS) which provides guidance in establishing tools and managing maintenance systems. An off shoot of the MMS is the "Maintenance Request Tracking System" and the "Performance Data and Trend Analysis" PDTA (management summary of the MR tracking system). The PDTA trends/graphs various department open MRs and provides a status of MRs either by priority of MR, by category of MR, or by department. This provides the only true trend analysis; however, it is done on an overall system or department level rather than specific component level. The "Plant Operations Experience Assessment Committee" CCI-139 is a committee reporting to the Plant Operations and Safety Review Committee (POSRC), that evaluates significant items pertaining to operating experiences at Calvert Cliffs and at similar designed plants. The committee researches INPO, NRC, NSAC, vendor, and Nuclear Notepad documents and makes recommendations to the POSRC regarding the information learned during their review. This information often identifies trends and generic problems for POSRC to resolve. The recurring problems identified in the inspectors sample were found in every case to have some task force, committee or realization by the licensee of the recurring problem, and corrective action in progress.

In order to improve trending analysis and information regarding failures the licensee is implementing a computerized system which will be able to enhance the licensee's ability to assess trends and evaluate root causes for specific component failures.

8. 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:

-- 210 B-2 Unit 2 Reactor Protective System Functional test observed on July 26, 1984.

-- STP-O-72-O Units 1 and 2 Control Room High Radiation Functional Test.

-- STP-M-471-1 Unit 1 Air Lock Door Operability and Leak Rate Test.

-- STP-M-471-2 Unit 2 Air Lock Door Operability and Leak Rate Test.

-- STP-M-550-0 Battery Inspection and Service Test

-- STP-M-150-0 Battery Pilot Cell Checks.

On August 8, 1984 the licensee technically incurred a loss of all Emergency Core Cooling System as follows: Three days previously, the licensee performed STP-M-550 "Battery Inspection and Service Test" which caused battery electrolyte levels to increase. Subsequently, on August 8, a weekly inspection of No. 21 battery per STP-M-150 "Battery Pilot Cell Checks" was performed and found the battery electrolyte level high. Technical Specification 4.8.2.3.2(a) requires the level between the minimum and maximum level marks in order for the battery to be considered operable. Since the 21 battery supplies control power to the #12 ECCS train components, the 12 ECCS train would be technically considered inoperable due to its "unreliable" source of control power.

Coincidental with this, earlier during the same day the No. 11 Saltwater Header was removed from service for preventative maintenance (cleaning and checking heat exchangers). The No. 11 Saltwater train provides cooling to the No. 11 ECCS pump room cooler which provides necessary support cooling to the Nos. 12 and 13 ECCS pumps. The licensee was already in an TS action statement because of the inoperability of the No. 11 ECCS train components. Therefore, when the battery level was found high and declared inoperable both ECCS trains were considered out of service. The plant entered into a TS 3.0.3 shutdown LCO action statement, however, an auxiliary battery was placed into service prior to the controlled shutdown.

The licensee will submit an Licensee Event Report regarding this event. The circumstances regarding the above were discussed with the licensee and Region I specialists. No inadequacies were identified regarding the licensee's actions.

9. Emergency Plan Drill

On July 13, 1984 the licensee conducted an Emergency Response Drill. The scenario was based upon a simulated loss of coolant accident resulting in approximately 11% fuel failure. Simulated personnel injury and fire complications were included. All levels of company (up to and including the Vice President level) management personnel were involved in the drill. The inspector observed activities in the Control Room, Technical Support Center (TSC), and the Operational Support Center (OSC), and observed the operation of the "Midas" offsite dose projection equipment. The inspector also attended the drill critique. Noticeable improvements over previous drills were evident in the OSC in that the various group operating stations were well laid out, excess personnel were eliminated, and coordination between groups was good. Improvements in status boards were noted. In previous drills the Plant Superintendent has remained principally in the Control Room. During this exercise, on a trial basis, that individual was

principally stationed in the TSC. Several comments were made during the critique that this new arrangement worked out better. This, of course, assumes that the TSC is staffed and operating prior to the arrival of the Plant Superintendent. Prior to the staffing of the TSC, licensee personnel felt that the Plant Superintendent should be in the Control Room.

No deficiencies were identified.

10. Radiological Controls

During this period, the inspector learned through discussions with various licensee personnel that material used in radiologically controlled areas (i.e., poly bags, rubber gloves and other "controlled material") was being buried in an onsite landfill. The inspector investigated this and determined that a landfill onsite outside the protected area was being used for the disposal of "clean" controlled material.

The inspector independently surveyed the area utilizing a Ludlum Model 14C (NRC instrument) and a Eberline PRM-7 micro-R meter (licensee instrument) and found no increase in background activity. A further review of records and surveys was also conducted. The licensee conducts the onsite burial of controlled material in accordance with Radiation Safety Procedure RSP-2-222 "Surveillance Requirements for Onsite Burial of Non-Radioactive Waste Generated in the Controlled Area". The procedure specifies that material can only be buried if when surveyed the radiation intensity is less than 5 micro-R. Guidelines are provided for the disposal of non-radioactive waste generated in radiological controlled areas. The licensee stated that this method of disposal costs more than disposal of the unsegregated radioactive waste, however, it displays an attempt to reduce the quantity of radioactive waste generated by the licensee. The inspector found no problems in this area.

During a tour of the owner controlled area the inspector noted a chain linked fence posted as a Radiation Area. This area encompassed several trailer trucks, each posted with radiation area placarding. The inspector independently surveyed the area, reviewed surveys of the area and verified that the licensee periodically performed surveys in the area. The licensee's surveys indicated that one truck within the area was classified as a high radiation area. The inspectors survey of the radiation area boundary indicated less than .5mr/hr at all areas.

The inspector discussed both of the above topics with a Region I radiation specialist. These topics will be reviewed by regional specialist during the next subsequent inspection by specialist in this area (317/84-19-02).

11. Reactor Coolant Pump Weld Leaks

At the beginning of this period the Unit 2 reactor was in Cold Shutdown due to a severe packing leak on the Power Operated Relief isolation valve and an apparent weld leak on the No. 22B Reactor Coolant Pump (RCP) controlled bleed off line. Subsequent investigation revealed the crack to be

on the pipe itself and not the weld. Engineers determined that the failure mechanism was due to long term fatigue and partially caused by people stepping on the pipe where it comes in close proximity to a nearby ladder. Additional supports are being evaluated, however were not installed at this time. Repairs were made by replacing the short length of pipe and flange, and re-welding the new pipe to the RCP. Subsequently, the unit resumed operation for approximately three weeks. On August 5-8 the licensee became aware and closely monitored a rising trend in the calculated RCS leak rate. Investigation (successive Containment entries) at zero power revealed an apparent crack on an flange off the controlled bleed off line on RCP-22B. A controlled shut down was performed. Close examination of the leak on August 10, 1984 revealed that the flange point was not leaking, that it was the filet weld on the pump to controlled leak off pipe, where the pipe meets the pump. The leak appeared to originate from a crack between the existing hole in the pump (designed for the leak off pipe) and the weld which is supposed to affix the pipe to the pump seal housing.

The inspector witnessed the cracks, various portions of the repair and the completed fix. Discussions regarding the failure mechanism were held with the licensee and a regional specialist. The licensee has, because of the recent trend in leak off piping failures, established a group to evaluate possible design changes to alleviate this type of failure.

The licensee returned Unit 2 to power operations on August 13, 1984 and has been monitoring RCS leakage by calculating RCS inventory on a daily basis and periodically touring accessible portions of Containment at least every two weeks.

The inspector identified no inadequacies with the licensee's actions in regards to this matter.

12. 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 reports were reviewed:

-- June 1984 Operation Status Reports for Calvert Cliffs No. 1 Unit and Calvert Cliffs No. 2 Unit, dated July 13, 1984.

13. 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.