

JAN 18 1985

Docket/License: 50-317/DPR-53  
50-318/DPR-69

Baltimore Gas and Electric Company  
ATTN: Mr. A. E. Lundvall, Jr.  
Vice President, Supply  
P. O. Box 1475  
Baltimore, Maryland 21203

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP); Report No.  
50-317/84-29; 50-318/84-29

This refers to the evaluation we have conducted of the activities at the Calvert Cliffs Nuclear Power Plant for the period of October 1, 1983 through September 30, 1984 and discussed with you on December 7, 1984 at the Region I office in King of Prussia, Pennsylvania. Your comments relative to our report have been reviewed.

Our overall assessment of your facility operation indicates there have been notable improvements in overall plant performance. Vigorous management involvement, oriented toward nuclear safety, was apparent in all functional areas evaluated.

Having been rated Category I in seven of nine functional areas evaluated reflects your commitment to sustain a high level of performance. Accordingly, we are placing the Calvert Cliffs Nuclear Power Plant on an eighteen month evaluation period for the next SALP assessment.

No reply to this letter is required. Your actions in response to the NRC Systematic Assessment of Licensee Performance will be reviewed during future inspections of your licensed activities.

Your cooperation with us is appreciated.

Sincerely,

Original signed by  
Thomas E. Murley  
Thomas E. Murley  
Regional Administrator

Enclosures:

1. Region I SALP, Calvert Cliffs,  
November 19, 1984
2. Region I Letter, R. W. Starostecki  
to J. P. Bayne, November 28, 1984
3. BG&E Letter, A. E. Lundvall, Jr. to  
R. W. Starostecki, January 3, 1985

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U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NO. 317/84-29; 318/84-29

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT

ASSESSMENT PERIOD: OCTOBER 1, 1983 - SEPTEMBER 30, 1984

BOARD MEETING DATE: NOVEMBER 19, 1984

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## I. INTRODUCTION

### A. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect the available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant operation.

A NRC SALP Board, composed of the staff members listed below, met on November 19, 1984 to review the collection of performance observations and data to assess licensee performance in accordance with guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance". A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at the Calvert Cliffs Nuclear Power Plant for the period October 1, 1983 through September 30, 1984.

### B. SALP Board Members

#### Board

- T. T. Martin, Director, Division of Engineering and Technical Programs (DETP)
- R. W. Starostecki, Director, Division of Project and Resident Programs (DPRP)
- \*R. R. Bellamy, Chief, Radiological Protection Branch, DETP
- \*J. H. Joyner, Chief, Technical Programs Branch, DETP
- E. C. Wenzinger, Chief, Reactor Projects Branch 3, DPRP
- \*D. H. Jaffe, Licensing Project Manager, ORB 3, NRR
- T. C. Elsasser, Chief, Reactor Projects Section 3C, DPRP
- T. Foley, Senior Resident Inspector, Calvert Cliffs Nuclear Power Plant

#### Attendees

- \*H. Booher, Chief, License Qualifications Branch, Division of Human Factors, NRR
- D. C. Trimble, Resident Inspector, Calvert Cliffs Nuclear Power Plant
- K. P. Ferlic, Project Engineer, Reactor Projects Section 3C, DPRP
- A. J. Luptak, Reactor Engineer, Reactor Projects Section 3C, DPRP
- A. A. Asars, Reactor Engineer, Reactor Projects Section 3C, DPRP

\*Indicates attendance during selected portions of the SALP board.

C. Background

1. Licensee Activities

Unit 1

At the beginning of the period the unit was shutdown undergoing its sixth refueling. No unexpected delays occurred. During startup testing a Main Turbine bearing failure occurred. Power operations commenced on December 12, 1983. On December 28, a reactor trip occurred due to a sudden speed decrease on a main feedwater pump (caused by a maintenance action) which led to a low steam generator level (actuating signal for reactor trip). Power operation resumed on December 31. On January 27, 1984 the unit tripped due to the simultaneous opening of all reactor trip breakers. The cause of the trip was never identified. The unit resumed continuous power operation until February 28, when the unit shutdown because of the unavailability/unreliability of the charging pumps due to the installation of poor quality packing material. Operations resumed on March 7. On May 3, severe graphitic corrosion problems were identified in the Unit 2 saltwater system. The unit was shut down at the time. When indications of similar problems were found in Unit 1, the licensee began confirmatory testing and based upon the results of the testing began planning for unit shutdown. At the urging of the NRC, Unit 1 was shutdown for evaluation and repairs on May 6.

The unit resumed operation on May 30 and continued through August 28 when the unit was manually tripped due to blockage of the circulating water flow by numerous fish on the traveling screens. Operations resumed on August 30 and continued through the end of the period.

Throughout the period numerous load reductions regularly occurred in order to facilitate maintenance and surveillance testing.

Unit 2

Unit 2 entered the period at 100% power. On October 11, 1983 the unit tripped on low steam generator water level (an automatic reactor protection system trip) following the loss of a main feedwater pump. Operation was resumed on October 19. On October 26, the reactor tripped on low steam generator water level following a closure of the main turbine steam admission valves (planned maintenance activity caused loss of a hydraulic control pump). On October 27, operation resumed. On November 5, the unit was removed from service to repair a leaking steam generator hand hole gasket. Operation resumed on November 6. On November 20, the unit tripped on low steam generator water level due to a loss of No. 22 feed pump. The licensee briefly returned to power operation when a

cracked weld was noted on a reactor coolant pump shaft seal pressure transmitter line. The licensee shutdown, repaired the weld and resumed power operation on November 26.

On December 17, during testing of the main steam isolation valves (MSIVs) the unit tripped on asymmetric steam generator pressure due to one valve sticking during a partial stroke test. Power operation resumed on December 19. On December 27, 28, and on January 21 a control element assembly inadvertently dropped into the core causing power reductions. No cause for the rod drops were identified. Power operation continued through April with minor reductions in power to facilitate secondary system troubleshooting. On April 15, the unit tripped due to a failed motor surge capacitor in the No. 22B Reactor Coolant Pump. Operation resumed on April 19 and continued until April 21 when the unit was shutdown for its fifth refueling outage. While shut down a graphitic corrosion problem was identified associated with the salt water systems. Repairs were made to component cooling water and service water heat exchangers on both units during this time.

Refueling continued through June. On June 20 the licensee attempted a startup, however, a failed reactor coolant pump shaft seal was identified which necessitated replacement. A startup was initiated on June 28, and on July 5 startup testing was completed and power operations resumed.

On July 9, the unit was shutdown due to RCS leakage greater than Technical Specification limits caused by a cracked weld on RCP-22B controlled bleed-off line. The unit returned to power on July 18, and continued operating until August 8, when the unit again had to be shutdown to repair a weld crack on the No. 22B reactor coolant pump bleed-off line. Power operation resumed on August 14. On September 14, the unit was shutdown after a control element assembly dropped and could not be recovered (shorted lift coil). Operations resumed on September 21, and continued through the end of the reporting period. The unit incurred five (5) automatic trips and seven (7) unplanned shutdowns during the period.

## 2. Inspection Activities

Two NRC resident inspectors were assigned during much of the assessment period. A turnover of Senior Resident Inspectors occurred during the period of April to June 1984. The total NRC inspection hours for the period was 3214 (resident and regional based), with a distribution of effort in the functional areas as shown in Table 1 (Inspection Hour Summary).

A special inspection was conducted during the week of March 26, 1984 to examine compliance with 10CFR50, Appendix R (fire protection) requirements.

A special inspection of the saltwater system graphitic corrosion problems was conducted on May 29 and 30, 1984.

An NRC Emergency Preparedness inspection team observed the annual emergency exercise on September 11, 1984.

Tabulations of Violations and Inspection Activities are attached as Tables 2 and 3 respectively.



## II. CRITERIA

Licensee performance is assessed in selected functional areas. Each functional area represents areas significant to nuclear safety and the environment, and for this period were the normal programmatic areas.

The following evaluation criteria were used to assess each area:

1. Management involvement and control in assuring quality.
2. Approach to resolution of technical issues from a safety standpoint.
3. Responsiveness to NRC initiatives.
4. Enforcement history.
5. Reporting and analysis of reportable events.
6. Staffing (including management).
7. Training effectiveness and qualification.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

Category 1: Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety is being achieved.

Category 2: NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and concerned with nuclear safety; licensee resources are adequate and reasonably effective such that satisfactory performance with respect to operational safety is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear strained or not effectively used such that minimally satisfactory performance with respect to operational safety is being achieved.

The SALP Board has also categorized the performance trend over the course of the SALP assessment period. The categorization describes the general or prevailing tendency (the performance gradient) during the SALP period. The performance trends are defined as follows:

Improving: Licensee performance has generally improved over the course of the SALP assessment period.

Consistent: Licensee performance has remained essentially constant over the course of the SALP assessment period.

Declining: Licensee performance has generally declined over the course of the SALP assessment period.

### III. SUMMARY OF RESULTS

#### A. Overall Facility Evaluation

Since the last assessment period improvements were noted in the Operations, Radiological Controls, Maintenance, Surveillance, Emergency Preparedness, Refueling, and Licensing Activities functional areas. No declines in performance areas were observed from the previous SALP period.

A vigorous management involvement has been routinely observed in plant activities. Newly established management programs are producing effective results, evidenced by a reduction in personnel errors and fewer unanticipated plant trips. Improved controls have been noted in the areas of drawings, modifications, maintenance and surveillance test procedures, operator training, maintenance requests, and the coordination and scheduling of activities for out of service components. Onsite managers are aggressive in demanding effective housekeeping, fire protection and personnel safety programs.

Improvement is needed in the following areas: (1) controls associated with temporary changes made to the facility without determining what potential impact the change may have on plant safety, (2) assessment of corrosion and the material condition of the plant salt water systems, and (3) management should consider whether the POSRC is organized in an effective manner such that adequate time is allotted to consider safety issues and assure the POSRC is adequately analyzing safety questions.

Overall, the licensee's performance has significantly improved from the last period as detailed herein. A better understanding of a few regulatory issues, as noted in the previous paragraph, appear to be warranted; however, the licensee's overall trends regarding cooperation and willingness to comply with requirements indicates that these issues should be resolved in the near future.

B. Facility Performance

<u>Functional Area</u>	<u>Category Last Period (10/1/82-9/30/83)</u>	<u>Category This Period (10/1/83-9/30/84)</u>	<u>Trend</u>
1. Plant Operations	2	1	Consistent
2. Radiological Controls	2	1	Consistent
3. Maintenance	3	2	Improving
4. Surveillance	3	2	Improving
5. Fire Protection/ Housekeeping	1	1	Improving
6. Emergency Preparedness	2	1	Consistent
7. Security and Safeguards	1	1	Consistent
8. Refueling and Outage Management	2	1	Consistent
9. Licensing Activities	2	1	Consistent

\*Performance in Plant Operations is generally consistent with the exception of two areas (evaluations of temporary plant changes and POSRC performance of safety reviews) which are decreasing.

#### IV. Performance Analysis

##### A. Plant Operations (31%)

###### 1. Analysis

The analysis of this area includes plant operational activities, as well as operational support activities. The area encompassed compliance with license and procedural requirements, licensee response to operational events, corrective action programs, reporting systems, staffing, Quality Assurance organization and audit implementation program, housekeeping, training and safety review committee activities.

The previous SALP determined the operations area to be Category 2. The most significant problem areas were operator errors, the discovery of several initial design and/or construction deficiencies, implementation of design changes prior to receipt of required Technical Specification changes, and misinterpretation of 10 CFR 50.59 requirements as they apply to temporary modifications. A SALP board recommendation was made encouraging the licensee to strive to ensure a more thorough understanding of Technical Specifications (TS) Bases and the FSAR by operations and maintenance personnel, and safety review committees.

The only recurrent problem identified during this SALP period was inadequate reviews pursuant to 10 CFR 50.59. Administrative controls associated with a temporary modification to a Chemical and Volume Control system let down line and reviews associated with the positioning of control switches controlling HPSI pump logic were inappropriate. In each case, documentation was not provided during the pre-installation review of the changes that stated why the changes are not considered an unreviewed safety question, as defined in 10 CFR 50.59. Resident inspectors have provided the NRC interpretative guidelines and discussed the topic with the licensee on several occasions. The problem appears to be, in part, a lack of understanding of 10 CFR 50.59 requirements. The licensee has upgraded controls in this area, but the procedures still do not include all of the NRC interpretative guidelines provided in the Inspection and Enforcement Manual. In response to last year's SALP board recommendation, training programs for both the safety committees and staff supervisors are in the process of being implemented which address TS bases and 10 CFR 50.59 requirements. As identified in the previous SALP, problems regarding performance of 50.59 reviews prior to the implementation of temporary changes continue thru this period and have been repeated during this writing. A mechanical jumper installed on the Auxiliary Feed Pump designated water storage tank to a non-safety related tank was performed without priorly determining and documenting the bases of the change not being an unreviewed safety question.

Notwithstanding, throughout this assessment period the licensee has demonstrated a high regard for the impact of equipment operability on safe operation. With the exception of the component cooling water heat exchanger, the licensee has routinely taken the conservative approach and declared questionable/suspect equipment inoperable. For example, Unit 1 was removed from service when a second charging pump was declared inoperable because its operability was suspect due to a packing leak.

With regard to NRC identified concerns, the organization is generally cooperative, and responsive. Their resolutions of certain technical issues associated with the graphitic corrosion problem have been captioned as "outstanding" by a region based inspector examining the technical adequacy of the repairs.

Operators have been diligent in recognizing and documenting entry into Technical Specification Action Statements and their expiration times. This practice contributes to awareness of plant conditions and ensures adherence to regulatory requirements. The NRC's AEOD (Office for Analysis and Evaluation of Operating Data) review of Licensee Event Reports found that the licensee's reports were informative, understandable and, as a package, they consistently met or exceeded the guidelines in NUREG-0161. The LERs were found to be sufficiently detailed to permit an assessment of safety and potential consequences.

A particular strength of the licensee is an experienced and stable management staff. Managers are developing younger staff personnel by such programs as selective job rotations and the training of engineers for NRC operator licenses. During this SALP period a considerable depth of staff expertise was demonstrated in the fields of fire protection (during Appendix R implementation) and metallurgy (analysis of graphitic corrosion problems).

The company also demonstrated a strong commitment to quality by continued emphasis on the QA program and management involvement in reducing the number of outstanding discrepancies identified by that program. NRC review of QA audits indicate that they are clearly understood, well-planned, and thorough. QC coverage is provided for 100% of the corrective maintenance on safety related components, 100% of the surveillance testing conducted by the mechanical maintenance group, and 20% (each) of the surveillance testing conducted by the Electrical and Controls (E&C) and Operations groups. The sample sizes are approximately the same as last year. Outstanding QA audit findings and non-conformance reports (NCR's) are trended, and results are periodically presented to senior management personnel. A reduction in the number of outstanding items has been seen. The QA auditing

group has been utilized during the period as a management tool in verifying that surveillance test procedures adequately address the Technical Specification surveillance requirements.

Additional evidence of management commitment to quality operation has been noted in the areas of personnel error reduction and drawing control. These were identified in the 1983 SALP as weaknesses. During the last SALP period operator and technician errors caused a significant number of plant events. The licensee calculated for calendar year 1983 a personnel error rate of 16%. Over the years 1981-1983, the plant averaged five automatic trips per year per unit, half of which were caused by personnel error. To deal with the problem, the licensee initiated employee awareness programs, required personnel incident reports, conducted event training, counseled personnel (based on incident severity), further defined personnel responsibility/accountability, and reorganized departments (where needed) to permit a greater amount of supervision in the field. Additionally, an effort was made to schedule preventative/corrective maintenance and surveillance tests which can cause trips only during outage periods. During the first nine months of 1984 no plant trips due to personnel errors occurred (in fact, only one automatic trip has occurred). Personnel error rate during this same period was 16% in the first quarter, 14% in the second and 10% in the third quarter. Although some errors continued to occur (e.g. steam generator water hammer caused by improper feeding of steam generators; inadvertent entry into Mode 1 due to inattention to nuclear instrumentation) the rate of occurrence has been reduced.

Past SALP reports mentioned licensee walkdowns of plant systems to confirm that drawings reflected as-built conditions and valve labeling. This effort is being repeated to re-verify corrected drawings and correct deficiencies in initial walkdown methodology. Re-verification efforts are approximately 60% complete, with the remainder scheduled for completion by the end of 1984. Currently, there is no backlog of critical drawing changes. New changes are now being incorporated within 48 hours. The licensee has purchased a computer assisted drafting machine to speed the change process. Much progress has also been made during this period to reduce the backlog of changes for non-critical drawings. Currently only six non-critical drawing changes are backlogged beyond their 90 days turn around period goal. The licensee's progress in drawing verification and incorporation of drawing changes is significant; however, additional effort is still required in the areas of (1) verification of Electrical & Controls (E&C) drawings, (2) generation of loop drawings for the E&C group, and (3) correcting pipe hanger drawings.

Strong management involvement and control in improving plant operations have been evident. Specific examples are:

- (1) An improved MR tracking system was implemented which more accurately quantified and characterized the backlog and provided improved performance indicators of each department's corrective actions.
- (2) A weekly scheduling system has been implemented to better coordinate plant operation, maintenance, surveillance, and preventative maintenance activities. The system is being administered by a senior licensed individual and it consolidates the activities associated with a component or system to minimize the "out of service time", the number of tagouts written, and the number of post maintenance test required. The system is in its infancy, however, beneficial effects are already noted.
- (3) An "Integrated Management System" is being developed. This system will be used by management to screen new issues and projects (company generated as well as NRC generated), assign priorities, determine implementation schedules based upon ongoing activities and resources, and track progress.
- (4) An integrated corrective action data system to identify plant problems/trends is under development. This system will track component failure and determine root causes of those failures which establish a trend.
- (5) Significant effort and resources have been expended toward improving plant cleanliness, housekeeping, and personal safety.
- (6) A Field Engineering Unit, under the Electric Engineering Department, was established to provide quick response engineering, improve interfaces between the site and the Baltimore Office, and to reduce backlogs of critical drawing changes.
- (7) Construction is in progress of a new materials storage and processing facility which will include improved provisions for storage of liquid and solid radioactive waste.
- (8) Construction is in progress to provide better facilities for the radiochemistry laboratory, Health Physics group, and controlled access/dress out areas.
- (9) Construction was completed on the new Office Training Facility and the new Emergency Offsite Facility. Construction of the simulator is still in progress.

Of particular note is the emphasis that has been placed on training. In May 1984 the licensee received INPO accreditation of their operator training program. This was one of the first



accreditations given. A favorable NRC review of the operator requalification training program coupled with strong operator license candidate performance on license examinations (e.g. 5 of 5 Senior Operator and 1 of 1 Reactor Operator passes with no generic weaknesses in May 1984) indicate the operator program is sound. The licensee is working toward INPO accreditation of their maintenance training program.

General performance of the operations group has improved. As noted above, isolated instances of personnel error have occurred, but the rate of occurrence has reduced. Performance of plant operators during routine and transient plant operations has been in accordance with procedures and consistent with plant safety. The operators are conscientious and morale appears high. Staff turnover rate due to resignations was about 3.5%. The licensee is contemplating partially manning the Auxiliary Building watch station with licensed individuals. The licensee has decided to postpone implementation of a six shift rotation in favor of strengthening the operations support staff.

In the area of safety committee performance, both the Offsite Safety Review Committee (OSSRC) and the Plant Operations and Safety Review Committee (POSRC) are carrying out their responsibilities in a generally satisfactory manner. Inspector observation indicated that the OSSRC members hold active discussions and review items with a proper questioning attitude. Both groups hold meetings more frequently than required. OSSRC meetings are informative, with stimulating and thought provoking questioning.

During review of a major safety issue (graphitic corrosion in salt water system cast iron components) potential weaknesses in the POSRC were indicated. The committee had been aware of general graphitic corrosion problems in the salt water system. When the corrosion problems on a Unit 2 Component Cooling heat exchanger were initially found to be much more severe than expected, the committee appeared slow to recognize the potential safety significance of the issue and failed to adequately consider worst case scenarios. Therefore, it did not properly advise the Plant Superintendent of actions that should be carried out if similar problems were found in Unit 1 and/or other components. Their initial focus was directed more at immediate details such as how to check for adequate wall thickness in other locations and ultimate long term corrective actions. Considerations such as accelerated plant shutdown, in the event of similar problems on the operating unit, had to be urged by the NRC.

In summary, licensee performance has significantly improved in many areas from the last period. Particularly, accomplishments are management programs to improve operations resulting in the

reduction of personnel errors and improved controls in the areas of housekeeping, fire protection, and drawing controls. Notwithstanding, additional management emphasis is required in assuring that (1) the POSRC is most effective in performing its intended safety review function and (2) temporary changes are properly evaluated prior to their implementation. Concerns identified in the previous SALP (pursuant to 10 CFR 50.59) continued to occur in this period and in fact have been identified again immediately after the period which demonstrate a non-improving, if not a decreasing trend in these two areas.

2. Conclusion

Category 1. Performance in Plant Operations is generally consistent with the exception of two areas (evaluation of temporary plant changes and POSRC performance of safety reviews) which are decreasing.

3. Board Recommendations

Licensee: Continued emphasis on developing the necessary controls for temporary modifications, improving drawing control, and reducing personnel errors. The licensee should assess whether the POSRC is organized in an effective manner such that adequate time is allotted to consider safety issues and whether the committee is sufficiently analyzing safety questions.

NRC: Conduct inspections on controls of temporary changes pursuant to 10 CFR 50.59. Senior Resident conduct an evaluation of POSRC activities.

B. Radiological Controls (11%)

1. Analysis

There were five inspections performed in the area of Radiological Controls during the assessment period by Region-based inspectors. The resident inspectors reviewed ongoing radiological control activities. Certain of these inspections examined several program areas including Radiation Protection, Transportation, and Radioactive Waste Management and Effluent Monitoring. An inspection was conducted at a burial site in the State of Washington by a representative of the state.

The licensee maintained a well-controlled radiation protection program. The radiation protection organization, staffing level, and personnel qualification programs were adequate to support the program. Adequately defined training programs were conducted for radiation workers and health physics technicians which contributed to acceptable personnel performance and adherence to procedures. Procedures and policies were defined and controlled. While a violation involving the implementation of a procedure for overtime for workers was noted, the problem was promptly corrected and did not appear to cause a substantial impact on worker health and safety. Audits of radiation protection activities were timely and findings were pursued and resolved. Documentation of radiation protection activities was complete, well-maintained and available. The site organization is adequately staffed with competent personnel.

The licensee's control over transportation of radioactive materials was generally adequate. Transportation procedures were controlled and explicit. Staff positions were clearly identified and program authorities defined. Based on observed personnel performance, the staff training appeared to be acceptable. The inspections did not identify any major deficiencies in the licensee's program. The licensee appears to be implementing an effective Transportation Program. Staffing appears to be adequate based on the fact that there are no difficulties with overtime and there is no apparent backlog of work in the transportation areas. A defined training program has been implemented for appropriate personnel.

In the Transportation Area, two violations were identified during the assessment period; one violation had to do with excessive dose rates at the surface to two packages, and the second violation was the failure to implement applicable criteria of Appendix B, Part 50. Licensee corrective actions for these violations were prompt and effective.

One onsite inspection by Regional Radiation Specialists of the licensee's Radioactive Waste Management and Effluent Monitoring Program was performed. The inspection identified one violation. The licensee was using numerous procedures, and the procedures had not been reviewed and approved as required by the Technical Specifications. The previous statement notwithstanding, the licensee has recently completed an extensive review and revision of its laboratory procedures. Procedures were well-stated and in sufficient detail to provide good performance during routine activities and nonroutine occurrences. The procedures included a complete purpose and background, acceptance criteria, corrective actions, reagent preparation, quality controls, calculations and references. The high quality of the procedures reflects a qualified and well-motivated staff.

No effluent release limits were exceeded and the licensee was in compliance with Technical Specification requirements throughout the period. With regard to staffing, key positions are identified and authorities and responsibilities are defined.

Based on the above considerations, the licensee is implementing an effective Radiological Control Program.

2. Conclusions

Category 1, consistent.

3. Board Recommendation

Licensee:

NRC: Routine inspection activities of the licensee's Radiation Protection Program be maintained.

C. Maintenance (11%)

1. Analysis

The previous SALP identified problems associated with personnel errors causing plant transients, inadequate procedures, training and lack of QC involvement in the maintenance area in general.

This SALP period included a close inspection of the maintenance trending and root cause analysis programs by the resident inspectors. Maintenance was observed routinely by the residents, and two regional inspections were performed regarding Non-Destructive Welding examinations and the Graphitic Corrosion of Cast Iron components.

As a result of the licensee's awareness of deficiencies in the maintenance area and responding to the previous SALP findings, increased awareness by supervisors is demanded. First line supervisors are required to spend 50% of their time in the field. General supervisors are also required to spend more time touring the plant. Additional emphasis has been placed on training. In the Plant Maintenance Department (PMD) bi-monthly training by supervisors is required of which one hour must be formalized classroom instruction. Craft personnel are required to receive 40 hours per year formal classroom training. Vendors are frequently brought on site to administer training and on the job training is now being documented. The PMD certification program is still under development. Portions of that program are being implemented.

In the Nuclear Power Department, training by vendors and plant systems training have been conducted on a regular basis for electricians and I&C technicians. Job task analyses have been ongoing since April 1984 which ultimately will produce qualification cards and standards. Interim qualification cards have recently been drafted and are expected to be implemented by the end of 1984. New I&C, electrical, and chemistry training labs have been constructed at considerable cost and equipped with high quality training aids.

"Supervisory Hold Points" are incorporated in procedures for those jobs deemed significant by management. QC has monitored the maintenance of all safety and non-safety related snubber work, all safety related corrective maintenance, and approximately 15% of all preventative maintenance.

The Preventative Maintenance (PM) program has established formal controls and is continually expanding and being improved. Currently, the various PM requirements are determined by vendor recommendations, engineering evaluations or supervisor awareness

of a problem. In PMD, for example, PM scheduling, monitoring, tracking, and coordination is now the sole responsibility of one dedicated individual. The PM work sheets now require "as found" and "as left" data, as well as acceptance criteria. A "Field Technician Review" is required to provide a "Feedback Mechanism" and an "Engineering Review" is performed on the completed PM. For safety related PMs a Quality Assurance and Plant Operations and Safety Review is required.

Maintenance management has focused extensive resources on planning, assignment of priorities and instilling pride and quality in workmanship in maintenance personnel. Planning, scheduling and consolidation of work to minimize out of service times, duplication of effort and reduction in personnel errors are being achieved by several efforts (see Operations and Surveillance sections for further details on error reductions). Daily maintenance meetings prioritize and schedule PMs, corrective and planned maintenance, and surveillance on components, and coordinate equipment availability through operations. This coordinated effort is currently scheduled for a one week time frame. The Shift Supervisor prioritizes the immediate corrective maintenance on a daily basis.

Management has developed several computerized tools to trend and track Maintenance Requests (MR)s. Weekly reports are generated on "Performance Indicators" of each of the departments within the organization. Goals are set and performance evaluated relative to the number of outstanding corrective MRs. For planning and scheduling purposes a workable level of about one month backlog of priority 3 or 4 MRs are maintained. The licensee adheres to this relatively well. There are approximately 1800 active corrective maintenance requests in the system. In general the numbers of MRs have been trending down. There is no backlog of outstanding priority 1 or 2 MRs. Implementation of a Nuclear Maintenance System will begin in January 1985. This system will provide improvements in maintenance tracking, planning, replacement parts handling, and historical data storage.

Notwithstanding the above, several shutdowns due to recurring problems such as excessive charging pump packing leaks, weld leaks associated with Reactor Coolant Pump vibration problems, main feed pump control problems, and control element assembly problems have occurred. The action taken to prevent recurrence appears slow, ineffective, or not generically applied (refer to Causal LER Analysis discussed under LERS). Although programs are established to evaluate each of the causes of problems listed above (and in some cases improvements have been made) the same problems continue.

Regarding item 11 (graphitic corrosion) addressed under Licensee Event Reports a specific inspection was performed, which captioned the resolution of the immediate problem (in regard to the efforts of the company material specialist and mechanical design personnel) as being an "outstanding job". Although the immediate technical resolution of the graphitic corrosion problem was good, the very fact that the problem reached such proportions indicates that the licensee's program to assess and correct salt water system corrosion problems has not been sufficiently aggressive. Signs of a growing salt water system corrosion problem continue to occur which further emphasize the need for a strong corrective action program.

One inspection regarding Non-Destructive Examinations (NDE) determined that the licensee was misapplying ASME acceptance criteria and the techniques utilized by ASME sections III and XI. Related problems have occurred in regard to Reactor Coolant Pump Controlled bleed off line welds (i.e., within one week after dye checking welds, an accepted weld failed causing a shutdown). Another applicable concern regarding NDE is in regard to the ultrasonic testing performed on the Component Cooling Heat Exchangers during the graphitic corrosion problem. The ultrasonic testing showed only mild degradation when in fact a significant degradation was at hand. The NDE program provided a false confidence to the licensee regarding the safe operation of the facility. Although these two specific examples may have occurred irrespective of the controls established, due to state of the art technology in the Non-Destructive Examination area, the licensee should either improve their expertise in this area or incorporate uncertainties in their confidence level provided by the NDE program.

A final concern regarding maintenance is apparent weak post modification follow up. The resident inspectors note that, periodically, installed TMI modifications become inoperable and remain so for extended periods of time. Specifically, the noble gas monitors are almost continually inoperable. Because these are not yet incorporated in the Technical Specifications, the controls for ensuring operability and priority for repair are insufficient. An apparent lack of support by the installing organization is evident in that new equipment is left installed and "operable" without appropriate spare parts and other attendant auxiliaries necessary to maintain or prove equipment operability.

In summary, the maintenance organization is effectively performing its intended function. Management tools have been effectively used and positive trends are evident in the management of maintenance problems. Several problems continue to exist that are slow in being resolved and continue to cause unanticipated

shutdowns. NDE has been less than fully successful in its role. Attention is warranted in post modification controls related to TMI installations, and in relation to the monitoring of salt water systems corrosion.

2. Conclusion

Category 2, improving.

3. Board Recommendations

Licensee: Should pursue: (1) more effective and timely correction action on root causes of repetitive problems, (2) provide additional confidence in the adequacy of the salt water system regarding the extent and degree of the various types of corrosion, and (3) provide additional attention to maintaining post TMI modifications operable. Although outside the SALP period, a recent inspection raises concerns whether equipment qualification is adequately considered in the maintenance program. Additional attention is warranted in this area.

NRC: Maintain inspection effort at the current level.



D. Surveillance (7%)

1. Analysis

During this evaluation period the resident inspectors reviewed the surveillance program and observed the licensee's surveillance activities. One region-based inspection reviewed the surveillance program and its implementation.

The previous SALP determined Surveillance to be Category 3 principally due to an excessive number of technician and operator errors during testing. Those errors caused several Engineered Safety Features Actuation System (ESFAS) actuations. The SALP board recommended that the licensee objectively assess the need for increased supervisory involvement and consider programs to upgrade personal accountability to minimize personnel error.

The licensee has taken several actions to reduce personnel errors, including increased supervision in the field. Personnel error rate is being trended and indicates that the program has been effective. More detail on the program and its effectiveness is presented in the "Operations" section.

The surveillance program is well defined by a plant procedure which includes a cross reference of Surveillance Test Procedures (STP's) and the associated Technical Specification (TS) requirement. Surveillance Test Coordinators in each of the working groups are responsible for scheduling and reviewing the tests assigned to their organization. QA audits reflect that the program is being properly implemented. In October, 1983 the QA group completed a year long effort to verify that every TS (including surveillance requirements) is addressed by some mechanism (i.e., logs, STP's, Special Procedures, etc.). In November, 1984 QA is scheduled to complete a related effort which verifies the technical adequacy of each STP. Procedural controls have been established to assure that TS changes are properly incorporated into surveillance procedures.

NRC sampling indicated that the surveillance program is, with the exceptions noted below, being properly implemented; TS changes are being incorporated; and STP's are being conducted by qualified individuals. Reviews of completed STPs were found to be timely and thorough. The Plant Operations Safety Review Committee reviewed all tests in which problems had been encountered. Records of completed STPs were well maintained.

Quality Control coverage is being provided for 100% of the mechanical maintenance group's surveillance activities and 20% of the Electrical and Control groups and operations groups activities.

A relatively high number of both administrative and technical problems were identified during the period which indicate that the QA STP verifications are needed and that continued management attention is warranted. NRC inspections identified eleven deficiencies in STP's. Two of these were significant in that the diesel generator load rejection capability was not being adequately tested, and operation of four dampers required for control room recirculation actuation were not being verified operable. During the period, four instances of missed or late STP's were identified (two were due to maintenance procedure inadequacies and two due to personnel error).

In summary, improvements have been made in the areas of personnel error reduction and STP verifications. The overall program appears to be well defined. Management attention is required to assure STP's are technically adequate and accomplished on time.

2. Conclusion

Category 2, improving.

3. Board Recommendation

Licensee: Continue emphasis on ensuring STP's are technically correct and accomplish TS requirements. Ensure timely completion of STP's.

NRC: None.

E. Fire Protection/Housekeeping (10%)

1. Analysis

One region-based team inspection was conducted. The resident inspectors monitored this area throughout the period. The 1983 SALP concluded that this area was a Category 1 functional area with no significant deficiencies.

The licensee maintains a strong commitment to an effective housekeeping, employee safety, and fire protection programs. With very few exceptions housekeeping is excellent. Contamination controls is also very good. Most operational areas inside the Auxiliary Building are accessible without protective clothing.

Although housekeeping was good during the last SALP period, the licensee made an additional major effort, at considerable cost, to improve cleanliness of the Turbine building, the Auxiliary building, and outside equipment/areas. Unnecessary tools, equipment, and scaffolding were removed and in some cases shipped off-site for cleaning. To maintain cleanliness and material condition, the plant initiated a program involving frequent tours by all levels of plant supervision up to, and including, the plant superintendent and emphasis on cleanup following maintenance. Cleaning responsibilities for all groups have been stressed. The Plant Superintendent set a goal for himself of conducting a separate two-hour tour with each of five General Supervisors each month. The inspectors have frequently observed the Plant Superintendent and other supervisors making area tours.

An inspection performed by a team of inspectors from the NRC and Brookhaven National Lab ascertained that the licensee is in conformance with 10 CFR 50, Appendix R, Section III.G, "Safe Shutdown." No violations, deviations, or other unacceptable conditions were identified by the team.

Protection of redundant safe shutdown equipment was generally provided as required by Appendix R, Section III.G-2. Alternate shutdown capability, as required by Appendix R, was found to be adequate. The procedures were generally good. A walk-through of the alternate shutdown procedures indicated that training and qualification programs for operators were fully effective.

Fire protection staffing was found to be adequate. There was substantial evidence of management attention to the program, including: a thorough Fire Hazard Analysis, installation of several modifications (before and after Appendix R became effective), good response to all NRC requests and correspondence, and a sound approach in resolving technical issues, such as employing the "Defense in Depth" concept.

In summary, fire protection and housekeeping programs at Calvert Cliffs are effective and aggressively pursued by the licensee.

2. Conclusion

Category 1, improving. The licensee continues to improve performance in this area, a positive trend is evident.

3. Board Recommendation

Licensee: None.

NRC: Based upon a successful Appendix R review and a category, rating in this area, regional inspection effort may be reduced.

F. Emergency Preparedness (13%)

1. Analysis

During the assessment period there were three (two announced and one unannounced) inspections of the emergency preparedness program. There were no problems or reportable events noted during the assessment period, which related to the licensee's state of emergency preparedness.

During the previous SALP period the licensee was rated as Category 2. A Category 1 was considered but the repetition of improvement items during the September 1983 annual exercise prevented this rating. During the annual exercise conducted during September 1984 there were no repetitions noted of prior improvement items.

A routine inspection was performed on December 12-16, 1983 of the overall emergency preparedness program, which included a review of the Emergency Response Plan. Seven improvement items were identified, five of which related to the meteorological program. An unannounced routine inspection was performed on August 13-17, 1984, covering those areas of the emergency preparedness program not covered during the previous inspection and a review of open items. No additional improvement items were identified. Appropriate actions had been taken in regard to the previously identified open items.

A full-scale exercise, conducted on September 11, 1984, was observed by a team of NRC inspectors and NRC contractor personnel. Although there were areas identified for improvement, the licensee demonstrated a capability to implement their emergency plan in an acceptable manner.

The licensee's commitment of substantial resources to the emergency preparedness program has provided a superior level of performance. The licensee's emergency preparedness staff which consists of nine full time employees, four of which are professionals, far exceeds the average staff of four typically at other Region I utilities. The new fully equipped Emergency Operation's Facility was successfully demonstrated operational during the annual exercise completed in September 1984.

2. Conclusion

Category 1, consistent.

3. Board Recommendation

Licensee: None.

NRC: Reduce priority regional inspection effort in this area.

G. Security and Safeguards (7%)

1. Analysis

During the previous SALP period the licensee's performance in this area was Category 1. No major issues were identified.

Two unannounced physical protection inspections were performed during the assessment period by a region-based inspector. Routine resident inspections continued throughout the assessment period. One violation was identified. No security events requiring reporting pursuant to the requirements of 10CFR73.71 occurred during the assessment period.

During the assessment period, the licensee reorganized the department responsible for security matters. The licensee, on its own initiative, requested a meeting and met with the Region I staff to discuss matters related to the physical security program, to introduce new BG&E personnel assigned to Security Program management, and to meet the Region I staff. The meeting was beneficial in understanding the new Calvert Cliffs organization and proposed changes to the Security Program. The re-organization was indicative of management's awareness and attention to the Security Program.

Interviews and observations throughout the assessment period indicated a commitment to provide and sustain an effective security organization capable of implementing NRC requirements for a physical security program. Both plant and corporate security management continue to exhibit a strong influence on the Security Program. The security staff supervisors responsible for the major functions of the plant security organization continue to provide effective supervision of their assigned manpower and responsibilities. Security Program audits were complete and timely and management's response to audit findings were prompt and effective indicating a strong management commitment to the program. Records were readily accessible. The excellent cooperation and frankness exhibited by all supervisors and shift personnel is further evidence of a strong management commitment to the program. The security organization's facilities are among the best found in this region indicating a willingness on the part of management to expend considerable resources to effect a sound program.

Licensee and contract security personnel demonstrate a highly professional appearance and carry out their duties and responsibilities in an excellent manner showing interest and dedication to the program. The security training department continues to provide excellent support to the security organization.

2. Conclusion

Category 1, improved.

3. Board Recommendation

Licensee: Maintain current effort.

NRC: Reduce inspection priority in this area.

## H. Refueling and Outage Management(10%)

### 1. Analysis

Refueling activities observed by resident and regional inspectors included Auxiliary Feedwater System modifications and testing, fuel loading, new fuel inspections, training, irradiated fuel inspections, outage coordination, startup and start-up testing, refueling cavity underwater operations, outage radiation safety, control of transuranics, and corrective action to graphitic corrosion problems. Additionally, the inspectors made general tours of the plant including the Containment buildings and reviewed the general condition of safety related equipment, component tagging, and system lineups.

Two refueling outages were conducted during the evaluation period (Fall 1983 for Unit 1 and Spring 1984 for Unit 2). There were several unscheduled outages on both units. The resident inspectors reviewed outage activities throughout the period. Three inspections by region-based inspectors examined refueling outage activities, and one specialist inspection reviewed the graphitic corrosion problem identified during refueling.

The previous SALP determined Refueling to be a Category 2 area principally due to deficiencies in document controls (e.g., aperture card control, use of uncontrolled prints in the field, design change notice control, etc.). A SALP Board recommendation was made to "sip" fuel during the Unit 2 refueling outage and replace leaking fuel pins.

These SALP concerns have been/are being addressed with work remaining to be done. The licensee conducted fuel "sipping" operations and located and replaced the leaking fuel pins. The "Operations" section of this report describes the significant progress made by the licensee in reducing backlogs of drawing changes and also describes areas where improvements are still needed. Aperture cards, with the exception of the electric test area, now accurately reflect current designs. Controls have been established for making hard copy prints from aperture cards to prevent use of outdated drawings in field activities.

Emphasis is being placed on the Design Change Notice (DCN) control area (e.g. resolving differences between the Electric Engineering Department computer generated DCN listing and the site DCN index) Emphasis is also being placed on improvements in posting and incorporating DCN's on drawings.

Startup physics tests were conducted according to approved test procedures. Test reviews were timely, thorough and technically sound. A four-day training class was conducted prior to actual



tests. Test supervisors and engineers were found to be knowledgeable and well-qualified. The Plant Operations and Safety Review Committee (POSRC) reviewed the Low Power Physics Testing results, indicating active management involvement with the tests. QA coverage during the tests was thorough and complete both for refueling and startup testing.

Evidence of management emphasis on quality was particularly noted in four areas. First, QA auditors were actively involved in monitoring refueling activities. Second, significant progress was made in closing out Facility Change Requests (FCR's) for work which was complete but action items still remained open (procedure changes, non-critical drawings, training, etc.). Third, the licensee has embarked on a program for verifying completeness of technical manuals and improving associated administrative controls. Finally, a renewed management emphasis was placed on resolving the problem of weld cracks on Reactor Coolant Pump (RCP) pressure sensing and controlled bleed-off lines, by conducting a detailed study.

An inspection determined that post modification operational tests had been satisfactorily completed and that plant operating procedures had been updated to reflect the AFW Modifications. There appeared to be a great deal of plant management involvement in the testing process. Test records were complete, well-maintained, readily retrievable and provided to the inspector in a timely manner. There was significant well-documented QC involvement in post maintenance testing.

Outage planning, scheduling, and conduct continued to be well controlled and centered around a core planning staff with a matrix organization of supervisory personnel, work leaders, and engineers from all plant groups. As noted in the "Maintenance" section new improvements in the overall maintenance planning process are being developed.

Deficiencies were noted, however, in the training and material areas. Licensee Management has taken action in each area, however, continued attention is warranted. Staff training weaknesses were noted in ASME code requirements regarding appropriate NDE testing requirements on electrical penetrations. Recurrent deficiencies associated with the Barton pressurizer pressure transmitters, Auxiliary Feedwater System steam admission diaphragm valves (CV4070, 4071), RCP seal line welds and charging pump packing need correction.

In summary, outage planning, scheduling and conduct is well controlled. The licensee has emphasized improvements in quality in several areas. Continued attention is needed in the areas of drawing control, and resolution of noted equipment deficiencies.

2. Conclusion

Category 1, consistent. The licensee has improved performance in this area from the last SALP period, a consistent trend is evident.

3. Board Recommendations

Licensee: Continued evaluation and correction of noted material deficiencies. Continue emphasis on drawing control and close out of FCR's.

## I. Licensing Activities

### 1. Analysis

During the present rating period the licensee's management demonstrated active participation in licensing activities and kept abreast of all current and anticipated actions. In addition, the management's involvement in licensing activities assured timely response to the requirements of the Commission's rules related to Fire Protection and Environmental Qualification of Electrical Equipment. The implementation schedules for compliance with these rules are being met by the licensee. The licensee's management consistently exercised good control over its internal activities and its contractors, and maintained effective communication with the NRC staff. The management's active participation was evident in its firm involvement in the issues of significant potential safety impacts. This is illustrated by the recent, successful, completion of the Calvert Cliffs fire protection review and inspection.

The licensee has also remained responsive to NRC environmental issues. Recent meetings and discussions with Baltimore Gas and Electric senior management has resulted in significant progress in resolving NRC/BG&E differences regarding the Radiological Effluent Technical Specifications.

The management and its staff have demonstrated sound technical understanding of issues involving licensing actions. Its approach to resolution of technical issues has demonstrated extensive technical expertise in all technical areas involving licensing actions. The decisions related to licensing issues have routinely exhibited conservatism in relation to significant safety matters. The licensee's sound communications during the rating period assured sound technical discussions regarding resolution of safety issues. During the reporting period, the licensee effectively resolved complex technical issues concerning fire protection, responses to NUREG-0737, Supplemental items, and environmental qualifications of electrical equipment.

On occasions, when the licensee deviated from the staff guidance, the licensee has consistently provided good technical justification for such deviations. The fire protection program and the program for environmental qualification of equipment are good examples illustrating the soundness of the technical justifications for deviations from the guidance. Such deviations were ultimately resolved via NRC issuance of relief from these requirements. When unusual events have occurred at Calvert Cliffs, the licensee has invariably used conservative approaches in dealing with the situations, and performed in depth analyses of significant safety issues raised by such events.

The licensee has been responsive to NRC initiatives during the SALP reporting period. During the rating period, management made every effort to meet or exceed the established commitments as illustrated by its responses to TMI action items and compliance with the rules related to fire protection and environmental qualification of safety related electrical equipment. Perhaps the most significant demonstration of the licensee's responsiveness to NRC initiatives is its willingness to re-examine its position regarding RETS which resulted in significant progress in a previously stalled review. In other areas, such as TMI technical specifications (Generic Letter 83-37) differences continue to exist between NRC and BG&E positions.

We expected that establishment of the intergraded schedule, toward which BG&E continues to make progress, will clarify priorities and thus improve the licensee's responsiveness.

The licensee continues to have a policy for timely and forthright reporting of operational events of importance. The analyses of operational events and proposed remedial actions show considerable effort toward non-repetition of these events. Moreover, the number of updated LERs indicates that the licensee continues to maintain interest in these events and to report additional information as it becomes available. In addition, during the SALP period a new LER form has been instituted which the licensee is using correctly and effectively.

The licensee has demonstrated considerable skill and diligence in carrying out its licensing activities. In particular, the licensee has integrated its licensing and change control processes, where appropriate, to secure appropriate levels of NRC authorizations in a timely manner. The level of technical expertise and management overview demonstrated in licensing activities is consistently high.

The licensing activities conducted by Baltimore Gas and Electric Company during the SALP reporting period were characterized by consistently high performance in the area of licensing activities. Submittals, made in support of applications for license amendments and in response to regulatory requirements, showed considerable care in preparation and a consistently high level of technical expertise and management overview. These efforts on behalf of BG&E have contributed to the completion of two major licensing reviews (Fire Protection and Environmental Qualifications of Safety-Related Electrical Equipment) and significant progress on a third issued (Radiological Effluent Technical Specifications).

The BG&E licensing organization has reached maturity and shows an efficient organization with ample technical expertise.

Of particular importance in this regard has been the expansion of the licensee's plant-site technical capability especially within the operational licensing and safety organization. This onsite capability has enhanced the ability of the licensee to analyze operational events and supply information as needed. In addition, there appears to be an improved understanding of the interrelationship among licensing, safety, and plant reliability especially with regard to component testing.

2. Conclusion

Category 1, .

3. Board Recommendation

Licensee: The licensee should continue its progress toward development of an integrated schedule approach to licensing. In this regard, continued involvement by senior licensee management would be desirable in setting priorities and implementing the system.

V. SUPPORTING DATA AND SUMMARIES

A. Investigations and Allegations Review

None.

B. Escalated Enforcement Actions

1. Civil Penalties

None.

2. Orders

None.

3. Confirmatory Action Letters

None.

C. Management Conferences Held During The Assessment Period

Salp Management Meeting at BG&E Corporate Office in Baltimore Maryland on December 20, 1983.

Management meeting to discuss graphitic corrosion problem associated with salt water components on May 16, 1984 in King of Prussia, Pa.

D. Licensee Event Report (LERs)

Tabular Listing

Type of Events:

A. Personnel Error . . . . .	8
B. Design/Man.Constr./Install . . . . .	.11
C. External Cause . . . . .	2
D. Defective Procedure . . . . .	3
E. Component Failure . . . . .	.20
X. Other . . . . .	.20

Total . .64

Licensee Event Reports Reviewed:

Report Nos. 317/83-55 through 84-06; and 318/83-54 through 84-08.

a. Causal Analysis (Review period October 1, 1983-September 30, 1984)

Twelve chains were identified:

- (1) LER's 317/83-55 and 318/84-04 concern main steam safety valves (MSSV's) not lifting at the proper setpoints (3 of 16 valves on Unit 1 and 13 of 16 valves on Unit 2). The affected valves were disassembled, inspected, and reset to proper setpoint. To prevent future recurrence the licensee has implemented a periodic valve internals inspection and will increase the frequency of setpoint testing.
- (2) LER's 317/83-66, 317/83-73, and 318/83-57 concern excessive leak rates at Containment Personnel Air Lock doors caused by gasket degradation. Preventative maintenance actions have been instituted to periodically lubricate and install new door gaskets.
- (3) LER's 318/83-65, 83-66, and 83-75 concern Control Element Assemble (CEA) reed switch position transmitter failures. Similar failures were mentioned in the 1982/1983 SALP report. The licensee attributed the failures to shorts in the reed switch position transmitters due to a common cause manufacturing defect. All transmitters were replaced, during the fall 1983 Unit 1 and spring 1984 refueling outages, with non-defective transmitters.
- (4) LER's 318/83-59 and 83-68 reported I-131 spikes due to fuel failures. The leaking fuel pins were identified and removed during the spring 1984 refueling outage.
- (5) LER's 317/84-01, 317/84-03, and 318/83-63 concern personnel errors which led to improper operation (opening in three cases and closing in one case) of Containment sample isolation valves. Corrective actions have included or will include employee training, technical specification changes, installation of new valve key switches (with key capture feature and uniquely keyed from other plant equipment), improved key control, and procedure upgrades.
- (6) LER 318/83-76 concerns two instances of CEA drops on Unit 2 for which no cause was identified. On September 14, 1984 CEA-3 on Unit 2 dropped due to an electrical short in the upper gripper coil. All gripper coils on CEA-3 were replaced to correct the problem.
- (7) LER 317/83-65 concerned excessive calibration drift of two Barton pressurizer pressure transmitters on Unit 2. The Barton pressurizer pressure transmitters have a design defect. They have been installed on both units to meet environmental qualification of electrical equipment requirements. The Unit 1 transmitters have shown similar calibration drift problems. The licensee is awaiting vendor

production of a new design transmitters to replace those currently installed. In the interim the licensee is closely monitoring for calibration drift problems.

- (8) LER 317/84-04 concerns charging pump packing failures. The licensee has had a long history of packing failures (average seal lifetime is about 16 days). For about a one week period in February 1984 the average seal lifetime dropped to about 4.3 days. The suspected cause was a shipment of poor quality packing material. The licensee has an ongoing program to determine the optimum combination of packing and plunger materials to improve service life.
- (9) LER 318/83-62 concerns a cracked weld in a Unit 2 Reactor Coolant Pump (RCP) pressure sensing line. Since October 1983, three instances of cracked welds in RCP controlled bleed off (CBO) lines on Unit 2 have occurred. The licensee has experienced a total of 23 cracked weld problems on RCP pressure sensing/CBO lines since the units began commercial operation (1974-1976 time frame). The failures appear to be vibration induced. Engineering efforts began in 1977 to determine the root cause. Sections of fixed sensing line tubing on both units have been replaced by flexible hose. The flexible hoses have apparently eliminated the problem on the Unit 1 sensing lines. The Unit 2 hoses were located further from the pump seal cartridge and have not provided a satisfactory solution. Efforts are now underway to modify the sensing lines on all RCP's to include flexible hoses near the seal cartridges. The licensee is evaluating alternative design changes for the CBO lines.
- (10) LER 318/84-03 concerns a failure of a Unit 2 RCP surge capacitor resulting in a Reactor trip. Several capacitor failures have been experienced with earlier style capacitors (Styles A and B). In 1979, Style C capacitors were installed. One Style C capacitor failed in June 1983. The subject failure occurred in May 1984. The licensee has replaced all capacitors with a newer model, will replace all capacitors every 4.5 years, and will check for capacitor degradation each refueling outage.
- (11) LER 317/84-05 concerns severe problems experienced with graphitic corrosion of cast iron components in the Salt Water (SW) systems on both units. New channel heads were installed on numbers 11 and 21 Component Cooling Water (CCW) heat exchangers (HX's). Numbers 12 and 22 CCW HX channel heads were encapsulated and are scheduled for replacement. Numbers 12 and 22 Service Water (SRW) HX channel heads were repaired with bolted patches. All heads were coated with coal tar epoxy, and improved cathodic



protection was installed to minimize further corrosion. Back heads on numbers 13 and 21 SW pumps were replaced. Other cast iron SW components were inspected and found satisfactory.

- (12) LER 318/83-74 concerned diaphragm failures of the newly installed Auxiliary Feedwater steam supply valves. Two additional failures of these valve diaphragms have occurred since this event.

TABLE 1

INSPECTION SUMMARY HOURS (10/1/83-9/30/84)CALVERT CLIFFS NUCLEAR POWER PLANT

	<u>HOURS</u>	<u>% OF TIME</u>
1. Plant Operations . . . . .	969	31%
2. Radiological Controls . . . . .	374	11%
3. Maintenance . . . . .	354	11%
4. Surveillance . . . . .	228	7%
5. Fire Protection/Housekeeping . . . . .	318	10%
6. Emergency Preparedness . . . . .	425	13%
7. Security and Safeguards . . . . .	242	7%
8. Refueling . . . . .	304	10%
9. Licensing Activities . . . . .	<u>NA</u>	<u>NA</u>
Totals . . . . .	3214	100%

TABLE 2

VIOLATIONS (10/1/83-9/30/84)

CALVERT CLIFFS NUCLEAR POWER PLANT

A. Number and Severity Level of Violations

Severity Level I . . . . .	.0
Severity Level II . . . . .	.0
Severity Level III . . . . .	.0
Severity Level IV . . . . .	.5
Severity Level V . . . . .	.7
Total Violations. . . . .	12

B. Violations Vs. Functional Area

<u>Functional Areas</u>	<u>Severity Levels</u>				
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>
1. Plant Operations				2	3
2. Radiological Controls				2	
3. Maintenance				1	
4. Surveillance				2	
5. Fire Protection/Housekeeping					
6. Emergency Preparedness					
7. Security and Safeguards					1
8. Refueling					1
9. Licensing Activities					
Totals				5	7
Total Violations	12				

SUMMARY

<u>Inspection Number</u>	<u>Inspection Date</u>	<u>Requirements</u>	<u>Severity</u>	<u>Area</u>	<u>Subject</u>
317/83-29 318/83-29	10/17-10/21	TS	V	2	Failure to implement procedures established in accordance with the NRC Policy Statement on Nuclear Power Plant Staff Working Hours for Radiation Chemistry technicians engaged in safety related work.
317/83-31 318/83-31	11/16-12/31	TS	V	1	Plant procedures for operation of the safety related AFW System were not adequately established in that initiation of an alternative means of AFW pump room cooling was not required following loss of normal room air conditioning for other than loss of AC power conditions.
		10CF50	IV	1	Sufficient measures not established to assure that corrective action would be taken to prevent recurrence of excessive pressurizer pressure transmitter calibration drift.
317/84-01	01/01-01/14	TS	IV	1	SV-6529 was without administrative control having been open since control fuses were installed.
318/84-03	02/15-03/13	TS	IV	3	Prior to initiation of MR activity an inadequate to verify realignment was conducted.
317/84-09 318/84-09	04/23-04/27	TS	IV	4	Procedures covering required surveillance tests for reactor coolant system chemistry and procedures covering determination of radioactivity in effluents were not reviewed by POSRC.

Inspection Number	Inspection Date	Requirements	Severity	Area	Subject
317/84-11	05/15-06/12	10CFR50	V	1	Failure to perform timely correction of a root cause valve labeling.
317/84-16 318/84-16	06/04-06/08	10CFR50	V	8	Procedures were not established to assure control of post modification punch lists or to assure documentation of satisfactory resolution of punch list items.
317/84-17 318/84-17	06/11-06/15	Security Plan	V	7	Licensee did not follow Procedure No. 130 (Plant Access Request and Authorization
317/84-18 318/84-18	06/12-07/10	10CFR50	V	1	Licensee made a change to the facility which is described in the FSAR by placing the swing HPSI pump in pull to lock position changing the logic described in the FSAR.
317/84-19 318/84-19	07/11-08/20	10CFR50	IV	4	Procedure STP-0-72-0 was inappropriate to the circumstances in that several components which would automatically actuate on high radiation were not being verified for proper operation.
317/84-20	07/23-07/27	10CFR71	V	2	Licensee did not identify radioactive material transport packages as a structure, system, or component to be covered by QA program; licensee did not establish receipt inspection program for radioactive material transport packages.

TABLE 3  
INSPECTION REPORT ACTIVITIES

Unit1/Unit2 REPORT NOS.	INSPECTOR	HOURS	AREAS INSPECTED
83-29/83-29	Specialist	45	Radiation Protection Program.
83-30/83-30	Resident	145	Routine Inspection.
83-31/83-31	Resident	187	Routine Inspection.
83-32/83-32	Specialist	32	Inspection of Startup Testing following refueling of Unit 2, and related test matters for Unit 1.
83-33/83-33	Specialist	24	Safeguards Inspection.
83-34/83-34	Specialist	38	Inspection of Startup Physics Testing following refueling of Unit 1.
83-35/83-35	Specialist	80	Emergency Preparedness Inspection.
84-01/84-01	Resident	288	Routine Inspection.
84-02/84-02	Specialist	40	Radiation Protection Program.
84-03/84-03	Resident	130	Routine Inspection.
84-04/84-04	Specialist	350	Inspection of licensee's efforts to comply with requirements of 10 CFR 50, Appendix R, Section III.G.
84-05/84-05	Specialist	30	Inspection of licensee's action taken to comply with requirements discussed in NUREG-0737, Item II.B.2.
84-06/84-06	Specialist	14	Inspection on previous findings and repair of Containment Spray System cracked weld.
84-07/84-07	Resident	142	Routine Inspection.
84-08/84-08	Resident	157	Routine inspection.
84-09/84-09	Specialist	128	Radioactive Waste Program Inspection.
84-10/84-10	Specialist		Examination Report of Operator Licensing Examinations.

REPORT NOS.	INSPECTOR	HOURS	AREAS INSPECTED
84-11/84-11	Resident	110	Routine Inspection.
84-12/83-12	Specislist	70	Inspection on previous inspection findings, audit program, offsite support staff, and surveillance program.
84-13/84-13	Specialist	80	Radiation Protection Program Inspection.
84-14/84-14	Specialist	10	Inspection of licensee's actions to correct salt water graphitic corrosion of Component Cooler Heat Exchanger and Service Water Heat Exchanger channel heads.
84-15/84-15			This inspection number cancelled.
84-16/84-16	Specialist	36	Inspection of TMI Action Item, Auxiliary Feedwater System Modifications.
84-17/84-17	Specialist	24	Safeguards Inspection.
84-18/84-18	Resident	141	Routine inspection.
84-19/84-19	Resident	161	Routine Inspection.
84-20/84-20	Specialist	74	Inspection of Transportation Activities.
84-21/84-21	Specialist	36	Startup Testing Data Review, Steam Generator Water Hammer.
84-22/84-22	Specialist	32	Emergency Preparedness Activities.
84-23/84-23	Resident	194	Routine Inspection.
84-24/84-24	Specialist	216	Annual Emergency Exercise.

TABLE 4  
TABULAR LISTING OF LERS BY FUNCTIONAL AREA  
CALVERT CLIFFS NUCLEAR POWER PLANT

<u>AREA</u>	<u>TOTAL</u>	<u>NUMBER/CAUSE CODES</u>		
1. Plant Operations		2/A	2/B	0/C 0/D 0/E 2/X
2. Radiological Controls		0/A	0/B	0/C 0/D 0/E 0/X
3. Maintenance		2/A	8/B	1/C 1/D 18/E 6/X
4. Surveillance		0/A	0/B	0/C 2/D 1/E 4/X
5. Fire Protection		0/A	0/B	0/C 0/D 0/E 1/X
6. Emergency Preparedness		0/A	0/B	0/C 0/D 0/E 0/X
7. Security & Safeguards		0/A	0/B	0/C 0/D 0/E 0/X
8. Refueling		0/A	0/B	0/C 0/D 1/E 1/X
9. Licensing Activities		0/A	0/B	0/C 0/D 0/E 3/X
		<u>U-1</u>	<u>U-2</u>	<u>Total</u>
Cause Codes: A. Personnel Error		2	2	4
B. Design/Man./Const./Install		5	5	10
C. External Cause		1	0	1
D. Defective Procedure		2	2	4
E1. Component Failure (For LER's generated prior to January 1, 1984)		9	11	20
E2. Management/Quality Assurance Deficiency (For LER's generated after January 1, 1984)		0	0	0
X. Other		9	8	17
	<u>Totals</u>	27	28	55



Table 5

CALVERT CLIFFS NUCLEAR POWER PLANT<sup>20</sup>  
LER SYNOPSIS

October 1, 1983 - September 30, 1984

<u>LER Number</u>	<u>Type</u>	<u>Summary Description</u>
<u>Unit 1</u>		
83-55	30 day	Three Main Steam Safety Valves did not Lift at Required Setpoint
83-56	30 day	Heat Damaged Snubber Discovered on Piping between Pressurizer and a Code Safety Valve
83-57	30 day	Cracked Weld on Instrument Stop Valve for #11B LPSI Flow Transmitter
83-58	30 day	Load Shed of #12 SRW Pump Inoperable
83-59	30 day	CVCS Chemical Isolation Signal for Channel ZF Inoperable
83-60	30 day	Fire Door between #11 Emergency DG Room and #12 Emergency DG Room Removed for Modification Work
83-61	30 day	Shutdown Cooling Return Isolation Valves were Shut Terminating Shutdown Cooling
83-62	30 day	Post-Accident Monitoring Instrumentation Channel X Inoperable
83-63	30 day	#11B Safety Injection Tank Inoperable
83-64	30 day	Individual Injection Leg Flow Rates Outside Allowable TS Limits
83-65	24 hour	Inadvertent Safety Injection Actuation occurred while in Mode 3
83-66	30 day	Excessive Leak Rate Past the Containment Personnel Air Lock Inner Door
83-67	30 day	Saltwater Inlet Control Valve 1-CV-5173 Inoperable
83-68	ETS	Oyster Samples Collected Showed AG-110m to be 170 pCi/kg (wet)

LER No.	Type	Summary Description
83-69	30 day	Response Time of Trip Circuit Breaker Undervoltage Devices Slower than Allowed by TS
83-70	30 day	Pressurizer Level Decreased Below 133 Inches in Past 30 Days
83-71	30 day	Pressurizer Pressure Decreased to 2180 PSIA
83-72	24 hour	Reactor Protective System Channels A and C for Reactor Coolant Flow Inoperable
83-73	30 day	Excessive Leak Rate Past the Containment Personnel Air Lock Outer Door
83-74	30 day	Flow Lost in Saltwater Subsystem when Operator Operated the 4KV Disconnect on Operating Saltwater Pump
83-75	30 day	RPS Channel D for High Power and Thermal Margin/Low Pressure Inoperable
83-76	30 day	AFW Pump Inoperable
83-77	ETS	Oyster Samples Collected for ETS Table Showed Ag-110m to be 113 +/-6 pCi/kg
83-78	30 day	Pressurizer level decreased below 133 inches three times
84-01	30 day	Failure to Implement Administrative Controls
84-02	30 day	Reactor Trip Breakers Opened Simultaneously Without Known Cause
84-03	30 day	Improper Operation of Containment Isolation Valves
84-04	30 day	Excessive Charging Pump Packing Failures
84-05	30 day	Saltwater System Graphitic Corrosion
84-06	30 day	Failure to Meet Limiting Condition for Operation Prior to Mode Change

LER No.	Type	Summary Description
<u>Unit 2</u>		
83-54	30 day	#21 Main Feedwater Regulating Valve Inoperable
83-55	30 day	Pressurizer Level Decreased Below 133 Inches Twice
83-56	30 day	#22 LPSI Pump Inoperable
83-57	30 day	Excessive Leak Rate Past Containment Personnel Air Lock Outer Door
83-58	30 day	During RCS Heatup Dissolved Oxygen Concentration was 1.0 PPM in Excess of Transient Limit
83-59	30 day	Dose Equivalent I-131 was 1.03 Micro-Curies Per Gram
83-60	30 day	Water Dripped Down Cable to Cable Spreading Room where it Shorted Components in the Coil Power Programmers
83-61	24 hour	#22 LPSI Pump Inoperable
83-62	30 day	Leak on #21A Reactor Coolant Pump Lower Seal Pressure Transmitter Line
83-63	30 day	CNMT RMS Sample Pump Inoperable
83-64	30 day	HPSI Header Isolation Valves Strokes Adjusted
83-65	30 day	Reed Switch Position Transmitter Stacks Inoperable
83-67	30 day	#22 Charging Pump was out-of-service; 23 Charging Pump Discharge Relief Valve Lifted
83-68	30 day	Dose Equivalent I-131 was 1.413 Micro-Curies Per Gram
83-69	24 hour	Reed Switch Position Indication Inoperable
83-70	30 day	Pressurizer Level Decreased to 116 Inches While Loading Main Turbine
83-71	30 day	Power Dependent Insertion Limit for Group 4 Rods Inoperable
83-72	30 day	#21 Main Steam Isolation Valve Inoperable
83-73	30 day	RPS Channel D for Steam Generator Low Pressure Trip Inoperable

LER No.	Type	Summary Description
83-74	30 day	AFW System Inoperable
83-75	30 day	CMI Inoperable
83-76	30 day	Two CEAs dropped into the Core
83-77	30 day	Leak in a Charging Header Drain Line
84-01	30 day	Isolation of Instrument Air to Fan Discharge Damper
84-02	30 day	Inoperable Radiation Monitor-Required Sampling Was Not Performed
84-03	30 day	Reactor Trip Caused by Surge Capacitor Failure
84-04	30 day	Main Steam Safety Valve Setpoints Out of Tolerance
84-05	30 day	Diesel General Inoperable
84-06	30 day	RCP Seal Bleedoff Line Weld Failure
84-08	30 day	Battery Inoperable

TABLE 6

COMPLETED LICENSING ACTIONS DURING SALP PERIOD

<u>ACTION</u>	<u>COMPLETION DATE</u>
1. Safety Evaluation (TMI Action Item II K.3.1 and II.K.3.2)	October 12, 1983
2. Technical Specification Changes Unit 1, Cycle 7 Operation (License Amendment No. 88)	November 17, 1983
3. Misc. Technical Specification Changes (Unit 1 License Amendment No. 89 and Unit 2 License Amendment No. 70)	December 30, 1983
4. Order extending the Completion Date for TMI Item II.F.1.1	March 2, 1984
5. Exemptions to Appendix R to 10 CFR Part 50	March 15, 1984
6. Technical Specification Changes - CEA Position Indication (Unit 1 License Amendment No. 90 and Unit 2 License Amendment No. 71)	March 16, 1984
7. Confirmatory Order (TMI Action Items)	March 16, 1984
8. Safety Evaluation - Seismic Qualifications of Auxiliary Feedwater System	March 21, 1984
9. Unit 2 Technical Specification Changes (Shutdown Margin and MTC - License Amendment No. 72)	March 27, 1984
10. Technical Specification Change - (Remote Shutdown Panel - Unit 2 License Amendment No. 91)	April 16, 1984
11. Misc. Technical Specification Changes (Unit 1 License Amendment No. 92 and Unit 2 License Amendment No. 73)	April 9, 1984
12. Technical Specification changes for Air Recirculation and Cooling Units (Unit 1 License Amendment No. 93 and Unit 2 License Amendment No. 74)	May 31, 1984
13. Safety Evaluation for TMI Item II.K.2.13	June 5, 1984

<u>ACTION</u>	<u>COMPLETION DATE</u>
14. Misc. Technical Specification Changes (Unit 1 License Amendment No. 94 and Unit 2 License Amendment No. 75)	June 6, 1984
15. Confirmatory Order (TMI Action Items)	June 14, 1984
16. Change to Security Plan (Unit 1 License Amendment No. 94 and Unit 2 License Amendment No. 76)	August 1, 1984
17. Misc. Technical Specification Changes (Unit 1 License Amendment No. 96 and Unit 2 License Amendment No. 77)	August 2, 1984
18. Safety Evaluation (TMI Action Item II.B.2)	August 16, 1984
19. Technical Specification Changes - (Unit 1 Auxiliary Feedwater System and Unit 2 License Amendment No. 78)	August 20, 1984
20. Inservice Inspection Code Relief (Section XI - ASME Code)	August 30, 1984

ENCLOSURE 2  
UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
631 PARK AVENUE  
KING OF PRUSSIA, PENNSYLVANIA 19406



DOCKET/LICENSE: 50-317/DPR-53  
50-318/DPR-69 NOV 28 1984

Baltimore Gas and Electric Company  
ATTN: Mr. A. E. Lundvall, Jr.  
Vice President, Supply  
P. O. Box 1475  
Baltimore, MD 21203

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP);  
Report No. 317/84-29; 318/84-29

The NRC Region I SALP Board has reviewed and evaluated the performance of activities at the Calvert Cliffs Nuclear Power Plant for the period of October 1, 1983 through September 30, 1984. The results of this assessment are documented in the enclosed SALP Board report dated November 19, 1984. A meeting to discuss the assessment has been scheduled for December 7, 1984 at the Region I office in King of Prussia, Pennsylvania.

At the SALP meeting, you should be prepared to discuss our assessments and your plans to improve performance. The meeting is intended to be a candid dialogue wherein any comments you may have regarding our report may be discussed. Additionally, you may provide written comments within 30 days after the meeting.

Your cooperation with us is appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard W. Starostecki".

Richard W. Starostecki, SALP  
Board Chairman  
Director, Division of Project  
and Resident Programs

Enclosure: SALP Report No. 317/84-29; 318/84-29

cc w/enclosure:

R. M. Douglass, Manager, Quality Assurance  
L. B. Russell, Plant Superintendent  
S. M. Davis, General Supervisor, Operations QA  
Thomas Magette, Administrator, Nuclear Evaluations  
R. C. L. Olson, Principal Engineer, Nuclear Licensing and Analysis  
J. A. Tiernan, Manager, Nuclear Power  
R. E. Denton, General Supervisor, Training and Technical Services  
NRC Resident Inspector  
State of Maryland (2)  
Public Document Room (PDR)  
Local Public Document Room (LPDR)  
Nuclear Safety Information Center (NSIC)

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