SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NO. 50-317/84-99; 50-318/84-99

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT

ASSESSMENT PERIOD: OCTOBER 1, 1984 - APRIL 30, 1986

BOARD MEETING DATE: JUNE 11, 1986

TABLE OF CONTENTS

		PAGE
I.	INTRODUCTION	1
	A. Purpose and Overview	1
	B. SALP Board Members	1
	C. Background	2
II.	CRITERIA	5
III.	SUMMARY OF RESULTS	7
	A. Facility Performance	7
	B. Overall Facility Evaluation	8
IV.	PERFORMANCE ANALYSIS	9
	A. Plant Operations	9
	B. Chemistry and Radiological Controls	13
	C. Maintenance	16
	D. Surveillance	20
	E. Emergency Preparedness	23
	F. Security and Safeguards	25
	G. Refueling, Outage Management and Engineering Support	27
	H. Licensing Activities	31
	I. Assurance of Quality	33
	J. Training and Qualification Effectiveness	36
V.	SUPPORTING DATA AND SUMMARIES	39
	A. Investigations, Petitions and Allegations	39
	B. Escalated Enforcement Actions	39
	C. Management Conferences	39
	D. Licensee Event Reports	40

TABLES

TABLE 1 - INSPECTION REPORT ACTIVITIES
TABLE 2 - INSPECTION HOUR SUMMARY
TABLE 3 - VIOLATIONS SUMMARY
TABLE 4 - LISTING OF LERS BY FUNCTIONAL AREA
TABLE 5 - LER SYNOPSIS
TABLE 6 - UNPLANNED TRIPS AND OUTAGES
TABLE 7 - SUMMARY OF LICENSING ACTIVITIES

ATTACHMENTS

ATTACHMENT 1 - TIME SHUT DOWN PER MONTH IN DAYS
ATTACHMENT 2 - TOTAL NUMBER OF SHUTDOWNS AND TRIPS PER YEAR SINCE STARTUP (UNITS 1 AND 2)

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.

The NRC SALP Board, composed of the staff members listed below, met on June 11, 1986 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, 1984 through April 30, 1986. It is noted that the summary findings and totals reflect a 19 month assessment period.

B. SALP Board Members

Board

R. W. Starostecki, Director, Division of Reactor Projects (DRP) and Chairman
E. C. Wenzinger, Chief, Reactor Projects Branch 3, DRP
L. Tripp, Chief, Reactor Projects Section 3A, DRP
T. Foley, Senior Resident Inspector, Calvert Cliffs NPP
D. Jaffe, Licensing Project Manager, NRR
A. Thadani, Director, PWR Directorate #8, NRR
W. Johnston, Deputy Director, Division of Reactor Safety
J. Joyner, Chief, Nuclear Materials Safety and Safeguards Branch, Division of Radiation Safety and Safeguards

Attendees

D. F. Limroth, Project Engineer, DRP
D. C. Trimble, Resident Inspector, Calvert Cliffs NPP

C. Background

1. Licensee Activities

Unit 1

At the beginning of the period the unit was operating at full power. On October 2, 1984, the unit was manually tripped due to the reduction of main circulating water flow caused by an accumulation of jellyfish on intake structure traveling screens. During plant restart, a Reactor Coolant System (RCS) over cooling event occurred which was principally caused by operator error in over feeding steam generators. RCS pressure dropped to 1775 psig. The unit returned to power on October 3.

On November 20, 1984, Unit 1 was again manually tripped due to an influx of jellyfish on intake screens. Following the trip, an extraction steam line ruptured filling the turbine building with steam and causing first degree burns to one individual. The unit returned to power on November 26. On November 29, the unit was shut down to repair a flex hose on Reactor Coolant Pump #11B pressure sensing line and a pressurizer sample valve. Power operation resumed on December 2.

On December 12, the unit was shut down to repair hydraulic system leakage on #11 Main Steam Isolation Valve (MSIV). During the shut down, #12 MSIV failed to shut completely. MSIV #11 was repaired and MSIV #12 successfully cycled (however cause of original failure of MSIV #12 was not positively identified). Power operation resumed on December 26.

On January 16, 1985, Unit 1 was shut down to repair safety injection tank check valve back leakage problems. During the shut down, the root cause of previous #12 MSIV problems was identified and corrected. The unit was restarted on January 19. On February 5, Unit 1 tripped on low steam generator level caused by operator error in opening a wrong breaker which resulted in a loss of main feeder pumps. Power operation was quickly resumed.

Unit 1 commenced its Cycle 7 refueling outage on April 6. On May 14, an interpolar connecting bar in diesel generator #11 broke free and caused damage to stator windings. That generator was ultimately replaced and similar bars were removed from the remaining diesel generators. The Unit 1 outage was extended to July 30 due to identification of damaged insulation in the main turbine generator. During restart, the shaft seal for #11 B RCP failed and the outage was extended to August 6. Three trips occurred during start up (high moisture separator reheater level caused by mispositioned valve, low steam generator trip due to operator error, and a trip due to improperly adjusted main turbine thrust bearing wear detector).

On September 30, and again on October 3, the unit tripped due to a DC system ground which caused spurious high main feed-water heater level indications to the main turbine protection system. Power operation was resumed and continued until October 9, when a shut down was initiated to repair a cracked RCP bleed off line. While on shut down cooling, 500 gallons of RWT water leaked into containment through the containment spray header due to a incomplete valve closure. Power operations resumed on October 15.

On January 23, 1986, the unit tripped due to a malfunctioning of a Reactor Trip Breaker during surveillance testing. It was restarted on January 24. From March 17-24, the unit was shut down to repair a degraded RCP seal and a leaking pressurizer relief valve. Power operation was then continued through the end of the period.

Unit 2

Unit 2 began the period operating at full power. On October 3, 1984, the reactor tripped on low steam generator water level due to the loss of #22 main feed water pump (cause of pump trip not positively identified). During plant restart, a series of personnel and equipment problems occurred nearly simultaneously (main steam safety valve stuck partially open, two control rod drops (same rod), a turbine bypass valve stuck shut then inadvertently opened, inadvertent isolation of a atmospheric steam dump valve). Power operation was resumed on October 4.

The unit was manually tripped on April 25, 1985 following indication that two shaft seals had failed on a reactor coolant pump (RCP). The plant was restarted on May 5; however, the reactor tripped on low RCS flow during power ascent due to a loss of #21 RCP (faulty relay caused breaker to trip). Power operation resumed on May 7. The unit was shut down from May 18 to May 22 to inspect and replace pressurizer spray valve fasteners. On May 23, with the unit at 100% power, an inadvertent Recirculation Actuation Signal (RAS) occurred due to technician error. No plant transients were induced.

On July 24, Unit 2 was shut down to repair steam leaks on a cold reheat steam line. During this shut down, #21 MSIV failed to fully close. Troubleshooting and repair activities took until August 5.

The unit began its sixth refueling outage on October 19. During the plant startup in early December, RCP #21 A seal became degraded, and the outage was extended through December 10, 1985. On December 12, the unit tripped on low steam generator water level due to the loss of #21 MFW pump (erroneous control signal). On February 4, 1986, the unit tripped for no apparent reason. The cause of the trip was never identified. Power operation resumed on February 5 and continued through the end of the period.

2. Inspection Activities

Two NRC resident inspectors were assigned during the inspection period. The total NRC inspection effort for the period was 5258 hours (resident and region based) or an average of 3312 hours per year with a distribution in the appraisal functional areas as shown in Table 2 (Inspection Hour Summary).

During the period, NRC team inspections were conducted of the following areas:

a. Actions taken relative to IE Bulletins 79-02, 79-04, 79-07, and 79-14.

b. Equipment Qualification (2 inspections).

c. Special inspection of equipment and activities identified in "Calvert Cliffs Probabilistic Risk Assessment Dominant Sequences" as important to prevent or mitigate severe accidents.

d. NUREG 0737 item implementation (Post Accident Sampling System, Containment Radiation Monitors, Noble Gas Effluent Monitor, and In Plant Radio-Iodine Measurements).

e. A team inspection of Post Accident Sampling System.

f. Operator Requalification Program.

g. IE Bulletin 80-11, Masonry Wall Design.

An NRC Emergency Preparedness inspection team observed the annual emergency exercise on September 10, 1985.

Tabulations of Inspection Activities and Violations are attached as Tables 1 and 3, respectively.

This report also discusses "Training and Qualification Effectiveness" and "Assurance of Quality" as separate functional areas. Although these topics, in themselves, are assessed in the other functional areas through their use as criteria, the two areas provide a synopsis. For example, quality assurance effectiveness has been assessed on a day-to-day basis by resident inspectors and as an integral aspect of specialist inspections. Although quality work is the responsibility of every employee, one of the management tools to measure this effectiveness is reliance on quality assurance inspections and audits. Other major factors that influence quality, such as involvement of first-line supervision, safety committees, and work attitudes, are discussed in each area.

The topic of fire protection is not discussed as a separate functional area because of insufficient inspection activity. The available observations on fire protection and housekeeping are included in the various relevant functional areas.

II. CRITERIA

Licensee performance is assessed in selected functional areas. Each functional area represents areas significant to nuclear safety and the environment, and are 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.

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

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 also assessed each functional area to compare the licensee's performance during the last quarter of the assessment period to that during the entire period in order to determine the recent trend for each functional area. The trend categories used by the SALP Board are as follows:

Improving: Licensee performance has generally improved over the last quarter of the current SALP assessment period.

Consistent: Licensee performance has remained essentially constant over the last quarter of the current SALP assessment period.

Declining: Licensee performance has generally declined over the last quarter of the current SALP assessment period.

III. SUMMARY OF RESULTS

A. Facility Performance

	Functional Area	Category Last Period (10/1/83-9/30/84)	Category This Period (10/1/84-4/30/86)	Recent Trend*
A.	Plant Operations	1	2	Consistent
B.	Chemistry and Radiological Controls	1	1	Consistent
C.	Maintenance	2	2	Consistent
D.	Surveillance	2	1	Consistent
E.	Emergency Preparedness	1	1	No Basis
F.	Security and Safeguards	1	1	Consistent
G.	Refueling, Outage Management and Engineering Support	1	2	No Basis
H.	Licensing Activities	1	1	Consistent
I.	Assurance of Quality	N/A	2	No Basis
J.	Training and Qualification Effectiveness	N/A	2	Consistent

*Trend during the last quarter of the assessment period.

B. Overall Facility Evaluation

The recent organization has had significant positive impact by providing increased management attention in all areas. Management support and resources are made available to correct recognized problems in a timely fashion. Numerous management programs continue to demonstrate the licensee's pursuit of quality, regulatory compliance, and efficient operations. Programmatic weaknesses were noted in the timeliness in which potential safety issues are recognized, lack of effectiveness in solving recurring problems in the Instrumentation and Controls area with a resultant effect on reactor operator performance, and the inadequate orchestration of multi-discipline tasks in that responsibility and authority are not vested in individuals in such a manner to ensure effective task completion.

In several instances, the licensee was slow to recognize the existence of potential safety issues. Extensive NRC involvement was required before thorough licensee actions were taken. In other instances, an excessive number of similar events occurred (e.g., reactor trips) before thorough licensee investigation, evaluation, and resolution of root cause(s). POSRC effectiveness was not demonstrated in that root cause identification and adequate problem resolution was not always required for POSRC concurrence. NRC often felt the need to question proposed actions, suggest additional actions, and generally become directly involved in a manner normally expected of licensee management and POSRC to achieve adequate resolution of potential safety issues.

A number of reactor trips and forced outages occurred in both units due to causes that appeared to be maintenance and design related. Other trips were due to personnel errors or were precautionary in nature as a result of maintenance/design related problems. Most trips due to such causes should be avoidable; however, the licensee had little success in reducing the frequency of such trips on either unit during the entire SALP period.

IV. PERFORMANCE ANALYSIS

A. Plant Operations (1295 hours, 24.6%)

1. Analysis

The previous SALP determined the operations area to be Category 1. It concluded that additional management emphasis was needed to (1) properly evaluate temporary changes (pursuant to 10 CFR 50.59) to the facility prior to implementation and (2) improve the effectiveness of the Plant Operations and Safety Review Committee (POSRC). That committee had been slow to recognize the potential safety significance of major salt water system corrosion problems. 10 CFR 50.59 evaluations have improved. However, although attempts have been made to improve POSRC effectiveness, significant problems continue to exist. Untimely recognition of potential safety issues and inadequate analysis for the identification and resolution of root causes of plant trips, ESF actuations, and other safety related problems persist. Inadequate root cause analysis was demonstrated by recurring Main Steam Isolation Valve (MSIV) inoperability problems becuase of failure to identify the root cause after the first event (see Maintenance functional area). Additionally, repeating plant trips resulted from feed pump control and feedwater heater level circuit problems. Again, root cause analysis was deficient after the initial and often after the second event (see Table 6 for trips occurring on 10/3/84, 9/30/85, 10/2/85, 12/12/85, and 2/4/86). An excessive number of events often have occurred before the licensee will dedicate sufficient time and resources to identify the root cause.

NRC involvement was necessary to heighten licensee awareness of potential safety concerns to a point where corrective action was initiated or, where necessary, accelerated. While some instances of this are to be expected, the relatively large number of occurrences during this SALP period indicates that a weakness exists in the licensee's process of screening for potential safety questions. Specifically, NRC involvement was necessary to: (1) obtain in-cubicle testing of reactor trip breakers; (2) conduct further troubleshooting of a main steam isolation valve; (3) conduct further troubleshooting of main steam safety valves; (4) adequately evaluate effects of a possible cavity seal failure; (5) adequately evaluate the use of belzona in repairing salt water system piping; and (6) initiate improvements within the Emergency Diesel Generator rooms. Notwithstanding this weakness, it should be pointed out that almost without exception, once the licensee fully recognizes the existence of a potential safety problem, they ensure that the root cause is identified and thoroughly resolved. An example of this was the troubleshooting and repair of a second main steam isolation valve. Plant management elected to maintain the plant shutdown to

continue troubleshooting (based upon unusual response characteristics) even though some evidence existed that the valve might be considered operable.

During the 19 month period, three reactor trips (2/1/85, 8/6/85, and 8/8/85) were attributable to operator performance; operating the wrong IAC circuit breaker (Instrument AC instead of Instrument Air Compressor) resulted in a turbine/reactor trip, failure to comply with the tagout control procedure resulted in a mispositioned valve and a turbine/reactor trip, and operator error in maintaining steam generator water level with a positive reactivity temperature coefficient. One SGIS actuation was caused by operators failing to block the signal in accordance with procedure during cooldown. Operators acted promptly and effectively to avoid several plant trips due to malfunctioning air compressor components, and acted prudently in initiating precautionary plant trips on 4/25/85 and 10/2 and 11/20/84 due to indication of a reactor coolant pump seal failure, and severe aquatic fouling of intake structure screens.

Some weakness was noted in the extent of control room operator knowledge of ongoing maintenance activities, including the potential impact those activities might have on plant operation. Additional weaknesses were noted in the interfaces between the operations and chemistry groups (e.g., containment isolation sample valves left open and sample sink left in recirculation mode without operator knowledge) and between the chemistry and licensing groups (e.g. who failed to communicate information on what constituted the primary and backup post accident sampling systems and failed to ensure the chemistry group was aware of a new surveillance requirement for the noble gas monitoring system).

Two losses of shutdown cooling occurred due to inadequate maintenance/test procedures. A recent AEOD report pointed out that the licensee has had a significant history of losses of shutdown cooling. A growing number of problems with control board indications (i.e., approximately 75 MRs per unit) hinder the plant operators' ability to monitor and react to plant conditions.

The licensee placed strong emphasis on prior planning. Division and department goals/objectives were clearly stated and widely disseminated in the form of a "Nuclear Energy Program Plan." They were directed toward improved performance versus maintaining status quo and addressed the areas of public safety, personnel safety, economic performance, productivity enhancement, and external perception. An Integrated Management System (IMS) has been implemented which provides a systematic method for prioritizing plant betterment and regulator identified projects by development of benefit to cost ratios. IMS is intended to provide a meaningful basis for negotiating implementation schedules with the NRC and a means for managing an integrated work plan for the site. It is closely coupled to the Nuclear Energy Program Plan.

Fire Protection, personnel safety, and housekeeping continued to receive strong emphasis. With few exceptions, housekeeping was excellent, and contamination control was good. The diesel generators, formerly a problem area due to significant accumulations of oil and grease on and under the engines, underwent upgrades to correct sources of oil leakage and were cleaned and painted.

The operations group took a lead role throughout this period in the area of coordinating maintenance and operations activities. They helped set maintenance priorities, optimize scheduling, tag equipment out of service at the proper time, and ensured post maintenance testing was accomplished. They improved their guidance on what specific post maintenance tests were required for various types of maintenance.

On January 1, 1986, major organizational changes were implemented which allowed full involvement of upper level company management in nuclear activities. Nuclear activities were separated from fossil and gas departments and placed under the direction of a vice president dedicated to nuclear operations. Three additional manager level positions were created on site. As part of the company reorganization, QC functions which had been previously assigned to the QA department were transferred to line departments. This was done to provide line supervisors with a tool to ensure work was being accomplished correctly under the philosophy that quality is a line function (see Assurance of Quality Functional Area). This action brought a compliment of QC personnel to the operations department. Due to the timing of these recent changes, it has not been possible to evaluate their effectiveness.

Staffing and training levels within the operations group were excellent. The licensee continued to display a strong commitment toward licensed operator training as evident by a high success rate in passing NRC Reactor Operator (RO) and Senior Reactor Operator (SRO) examinations. Annual written requalification examinations were administered to 29 SROs and 25 ROs in which 1 SRO and 1 RO failed, who were subsequently re-examined successfully. Three NRC administered examinations were successfully passed upgrading RO licenses to SRO licenses. A Training Effectiveness Inspection was conducted pursuant to Regulatory Guide 1021 in which 2 SROs and 4 ROs of one shift crew received NRC written and oral examinations; 3 SROs and 2 RO operations staff workers received just an oral examination and another 3 SROs and 2 RO staff workers received a written examination. Two individuals failed the written examination, but were subsequently re-examined successfully. No generic weaknesses were noted during the inspection. The licensee maintained 69 current licenses, 38 SROs and 31 ROs. Discussions with licensed operators indicated that the training staff was responsive to their input, and that training improved in quality with the advent of new site specific simulator in January 1986. Formally, the simulator

began operation in September 1985 with symptom based Emergency Operating Procedure training. Simulator training was preceded by meetings between the operations crew shift supervisor and the simulator instructor. This provided operations input and tailored each class to specific perceived weaknesses as well as the requisite training.

The operations training program had an in progress task analysis to define the specific skills of the operator. This job task analysis was being combined with INPO's requirements and NRC's KSA Catalog (Knowledge, Skill, and Abilities).

In summary, the Operations Department provided excellent prior maintenance planning and logical assignment of priorities. Conservatism was routinely exhibited after a potential safety issue was recognized. There were few long standing regulatory issues. Weaknesses were noted in operator awareness and possible effects of ongoing plant maintenance and personnel errors contributing to reactor trips, ESF actuations and losses of shut down cooling. A significant weakness was noted in the apparent reluctance to perform a thorough diagnostic assessment for true root cause of events in a timely fashion and excessive reliance on NRC involvement before potential safety issues were recognized and adequately pursued.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Board Recommendation

Licensee

Increase management attention to more aggressively recognize potential safety issues and to improve the root cause analysis of problems.

NRC

None.

B. Chemistry and Radiological Controls (901 hours, 17%)

1. Analysis

There were fourteen inspections conducted by radiation specialists during this period. The inspections examined the licensee's radiation protection program, radioactive waste management and effluent controls, environmental monitoring program, and transportation of radioactive material. A team inspection of Post Accident Sampling Systems and a non-radiological chemistry program review were also performed. Resident inspectors monitored the implementation of the radiation protection programs, as well. There were four Licensee Event Reports (LERs) in the Radiological Controls area during this assessment, the same number as in the previous assessment period. However, they were not repetitious.

The radiological protection program was well staffed with highly qualified and trained personnel. Particular program strength was evidenced by the high quality performance of the radiological controls staff in several program areas, including the ALARA program, and controls during the conduct of high exposure operations.

Facilities and equipment were well maintained with excellent performance records, including the new material processing facility. This new facility provided for well controlled and timely maintenance, testing and inspection of respirator protection equipment. This contributed to a high quality respirator protection program. Due to fully qualified staff and well designed facilities, a strong program for handling, storage, and segregation of radioactive waste was in place. The equipment, facilities, and operations of the whole body counting facilities were particularly impressive. Using these facilities, the licensee measurements of the NRC provided phantom were in full agreement with the type and quantities of isotopes in the phantom.

The ALARA program was strong and effective with good management support. ALARA reviews of planned work was thorough and revaluation of work in progress was excellent. During the course of several inspections in this rating period, the ALARA program was examined and found to be commendable.

The licensee's ALARA person-rem goal for the site was 720 for 1985. The total exposure for 1985 was 648 person-rem. During 1985 significant radiological operations occurred including two refueling outages. An aggressive ALARA person-rem goal (upper limit) for 1986 was established at 391 person-rem for the site. By the end of this assessment period, only 13% of the limit had been experienced. This was due to the licensee's management commitment to effectively reduce radiation exposure.

The external and internal exposure control programs were well founded and technically sound. These programs were supported by clearly defined policies and procedures. However, non recurrent violations were identified by NRC including failure to follow procedures, exposure records keeping, and lack of a detailed procedure for the standup whole body counter. These were infrequent minor problems and not indicative of any substantial program weakness.

The radiation controls Quality Assurance audits were performed in a timely and comprehensive manner. Correction of audit findings was timely and technically sound.

The licensee implemented an effective radioactive waste management program. Licensee personnel at all levels in the radwaste operations were very knowledgeable with regard to their functions and responsibilities. No problems were identified. On going training was evident.

Based on an inspection conducted October 1985, the licensee did not have a program that included implementing procedures for identifying, sampling, and analyzing the various waste streams to assure compliance with 10 CFR 61, even though a program was required after December 27, 1983.

The licensee performed periodic audits of the transportation program. The audits were performed in accordance with the requirements of Part 50, Appendix B. However, the frequency of auditing criteria applicable to transportation of radioactive waste was not specifically established.

The licensee had adequate chemistry and radiochemistry programs. The licensee met Technical Specification requirements for in plant and effluent sampling and analysis, and, in particular, the licensee met their new Radiological Effluent Technical Specifications (RETS), which were implemented on July 1, 1985. Review of the licensee's implementation of the RETS noted a lack of thoroughness in some areas. For example, surveillance procedures had not been formalized for monitor calibration, training was not well documented and records of procedure change for the liquid discharges were not available.

During the assessment period, an inspection was conducted using the NRC I Mobile Radiological Measurements Laboratory. All in plant and effluent samples split between the licensee and the NRC during this inspection were in agreement. Minor follow up items were identified during this inspection that indicate a lack of initiative by the licensee to make constant improvements in the program in order to maintain and improve the quality of the analytical measurements. These items included the quality control of radiochemical measurements including lack of participation in any interlaboratory comparions, use of control charts, and other control statistics.

Weaknesses identified in the non-radiological chemistry program were eliminated and toward the end of the SALP period, significant improvements in the controls of analytical measurements were achieved.

NRC inspections identified significant deficiencies in the Post Accident Sampling System (PASS). A failure of the on site chemistry group to assign sufficient priority to the operation of PASS led to a number of these deficiencies (e.g. inadequate procedures and system dilution factors not determined). However, causal factors external to the chemistry group were also involved. PASS problems are therefore more fully addressed in the Refueling Functional Area of this report.

In summary, only minor problems were identified regarding personnel exposure controls and technical specification surveillances for plant ventilation systems.

2. Conclusion

Rating: Category 1.

Trend: Consistent.

3. Board Recommendation

Licensee

None.

NRC

None.

C. Maintenance (837 hours, 16%)

1. Analysis

The previous SALP identified problems with (1) recurring equipment deficiencies, (2) insufficiently aggressive program to assess and correct salt water system corrosion problems, (3) and weak post modification follow up (insufficient controls for ensuring operability and priority for repair as well as lack of support by the the installing organization) for TMI action plan items. Additionally, a concern was raised whether equipment qualification was being adequately considered in the maintenance program. A summary of licensee performance in these areas is described below.

Resolution has been achieved on most of the material problems noted in the last SALP report. Problems with charging pump packing leakage and SGFW pump control continued. Charging pump packing was a concern because the licensee recently took credit for these pumps in their safety analysis. Barton pressurizer pressure transmitter drift problems were still occurring, but at a reduced rate. Barton had not provided an acceptable resolution, and the licensee was asking another vendor to develop and provide a substitute transmitter. During the interim, Barton transmitter performance was routinely monitored to detect drift.

A large program was ongoing regarding salt water system corrosion problems. The thorough corrective action program for components susceptible to graphitic corrosion was on track. A number of those components had been replaced (e.g., component and service water heat exchanger channel heads), and plans were underway to replace others (e.g., salt water pump casings). Improved inside wall coatings and cathodic protection were being used. A general problem still existed with wall thinning and periodic occurrence of small, through-wall holes in carbon steel piping, where the cement-mortar protective lining had eroded or broken away. This leaves the bare metal directly exposed to the corrosive effects of saltwater. A program was ongoing to replace piping in high turbulent flow areas with rubber lined pipe.

NRC inspections during the period disclosed significant deficiencies in the installed Post Accident Sampling System (PASS). These deficiencies are described and included in this assessment in the Refueling Outage Management Functional Area of this report. Finally, during the period, a program to include equipment qualification requirements in maintenance activities was implemented. Further details on licensee performance in equipment qualification areas is also provided in the Refueling and Outage Management Functional Area where its impact on this assessment is considered.

The recent company reorganization described in the operations section brought increased management attention to the maintenance area. As a result of an in depth review of the maintenance program, major changes and enhancements of existing programs were being initiated:

1. Implementation of the systems engineer concept.

2. Creation of a centralized planning and scheduling group that provided improved coordination within the maintenance department and with the Operations Department.

3. Improvements in training programs.

4. Joint effort with the Electric Power Research Institute (EPRI) to upgrade design and performance of valve packing.

5. Establishment of a "roving" maintenance crew on the back shift to support post maintenance testing and to conduct minor maintenance activities. This program has proven effective in reducing the number of outstanding maintenance requests.

The licensee made major changes in the Quality Control (QC) area. Maintenance QC functions were transferred to the Maintenance Department. An enhanced cross training program was initiated to improve QC inspectors knowledge and skills and maintenance personnel's knowledge of the quality control philosophy.

Notwithstanding the above, the following problems were identified:

1. During the period, weaknesses were noted by the NRC in the qualification program for maintenance personnel assigned responsibility for Reactor Coolant Pump (RCP) seal rebuilding. This coupled with seal performance problems in service caused the licensee to organize a RCP shaft seal task force to review seal performance, training of maintenance personnel, quality of spare parts, operating practices, and maintenance procedures.

2. Problems were noted in the area of maintenance procedures. Two losses of shutdown cooling events resulted from inadequate procedures by the Instrument and Control Department. The licensee exercised the option of omitting detailed steps from procedures when the task was considered within the knowledge, skills, and abilities of the worker. Additionally, certain temporary modifications (lifted wire/temporary jumpers) were exempted from screening for unreviewed safety questions when accomplished and restored within one shift. In combination, the option of omitting detailed steps in maintenance procedures and the exclusion of reviews of certain temporary changes has

led to abuse and allowed work on safety related systems without adequate screening for possible effects. Procedure writing groups were appointed and were rewriting/revising procedures. More than two hundred maintenance related procedures were improved through such efforts during this assessment period.

3. Following an incident where pressurizer spray valve fasteners failed due, in part, to over torquing, the licensee embarked on an extensive program to improve training and controls over fastener torquing.

4. Problems due to main feedwater pump speed control circuity possibly due to electrical grounds and/or component failures led to two plant trips during the SALP period and two additional trips immediately following the period. Electrical grounds on feedwater heater level control circuity caused two automatic plant trips. Additional maintenance problems led to unplanned trips and outages and included: safety injection tank check valve leakage, a main steam isolation valve hydraulic oil system leak, and an improperly adjusted thrust bearing wear detector. The cause of one trip late in the SALP period was unidentified but may also have been due to an electrical ground problem. The licensee willingness to "live with" ground problems prompted more active NRC involvement to effect problem resolution.

Although the corrective maintenance backlog was relatively low at 600 Maintenance Requests (MRs) or 5 man weeks, numerous MRs accumulated on each unit's control board (75 on each). Each MR was evaluated with respect to its effect on the system. However, no evaluation was done on the total effect of the sum, nor was a limit established before a concerted effort was devoted to reducing the shear volume of MRs/problems with the control boards. Most of these MRs were related to the I&C Department. Further, several plant trips were apparently caused by poor maintenance (see Table 6). Several trips were repetitive due to a lack of thorough understanding of the control systems (see trips dated October 3, 1984, September 30, 1985, and December 12, 1985). Together, the backlog of I&C related MRs on the control boards and related plant trips without sufficient control systems expertise indicates a weakness in this segment of maintenance, and contributes to confusion and impaired performance by the reactor operators.

Despite the licensee's efforts to minimize rework and to identify root causes of problems, their approach to the resolution of problems differed with each occurrence. There was no pre-planned standard approach that was well laid out, nor any set group of personnel that had experience in problem solving. Troubleshooting efforts appeared to be overly limited to the perceived most likely

causes to the exclusion of others. Because of this the approach to resolution of several technical issues was less than thorough and progressed at times in an impulsive fashion.

The licensee has the capability to thoroughly evaluate and satisfactorily resolve problems once they are focused and committed. The plant nuclear engineering group (part of the maintenance department) worked very effectively with the General Supervisor Operations in resolving three equipment problems (two main isolation valve issues and main steam safety valve setpoint drift problems).

In summary, several of the material problems identified in the previous SALP have been corrected. Continued effort is still required to fully resolve main feed water control, salt water system corrosion, charging pump packing, Barton transmitter, reactor coolant pump seal, and steam piping erosion/movement/support problems. The reorganization strengthened the Maintenance Department by placing a manager on site who was the previous plant superintendent. Increased resources were being devoted to this area. The establishment of the systems engineer concept and other innovations have the potential for improved performance in this area. Major changes were already evident, i.e., diesel generator up keep, condensate area clean up, and roving maintenance crew reduction of maintenance backlog. Procedure development and training programs resulting from task analyses were in progress. Additional I&C engineering support is needed because of weaknesses in the staffing, direct line supervision, vendor support, and spare parts areas. Increased screening of maintenance activities for possible unreviewed safety questions is needed.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Board Recommendation

Licensee:

Evaluate impact of secondary system maintenance problems on reactor trips (frequency, cause). Determine if poor maintenance and/or design weaknesses are contributing to balance of plant related trips.

NRC:

Conduct meeting with licensee to discuss their trip reduction program efforts.

D. Surveillance (885 hours, 16.8%)

1. Analysis

The resident inspectors examined surveillance activities as part of the routine inspection program. Surveillance procedures related to specialized areas of inspection were reviewed during thirteen inspections conducted by region based personnel.

The previous SALP noted that NRC inspections had identified a significantly high number of administrative and technical deficiencies in surveillance test procedures (STP's). An in depth QA auditing effort was conducted by the licensee to correct problems of this nature by ensuring that (1) STP's adequately accomplish all Technical Specification surveillance requirements, (2) systems are properly restored to proper alignment following STP's, and (3) surveillance tests are properly documented. There were two instances of deficient procedures during this period. One led to an initiation of an Engineered Safety Features Actuation system. A second resulted in missed surveillance tests on two control room ventilation dampers. The reduced rate of occurrence indicates that the quality of test procedures as a whole has improved. The control room damper problem was recurrent from the last SALP period indicating that initial corrective actions for that system were not sufficient to recognize remaining deficiencies.

The number of missed/late surveillance tests was reduced from a total of four last SALP period to one during this period.

NRC inspections covered a broad cross section of surveillance activities. In general, procedures were found to be clear and technically sufficient; and testing was accomplished in accordance with procedures by appropriately qualified personnel. Workers performing those tests appeared knowledgeable of the systems and testing requirements. QC/QA involvement was evident. Surveillance activities for the following areas were included within the scope of these inspections: plant mechanical and electrical systems, containment leak rate testing, in service inspections, environmental monitoring, radioactive effluent monitors, refueling, snubber program, control room habitability, ventilation filter testing, and chemistry sampling.

The licensee continued the practice of conservatively entering Technical Specification action statements when equipment was undergoing surveillance tests. This assured operator awareness of plant status and discouraged maintenance on redundant trains that could cause degraded conditions.

Management planning was evident in the area of In Service Inspections (ISI). A majority of the system ten year hydrostatic tests requirements were completed in advance of the upcoming ten year ISI refueling outages.

The licensee conducts surveillance programs which go beyond minimum Technical Specification requirements relative to steam generator (SG) integrity and primary chemistry. They took an active role in industry efforts in these areas. A steam generator task force was organized by the licensee to monitor eddy current testing, chemistry hide out, condenser air in leakage, steam generator lay up conditions, sludge lancing, and abnormal chemistry trends. During outages the licensee consistently performed eddy current testing on more than the minimum number of SG tubes required by Technical Specifications.

The recent company reorganization necessitated changes in surveillance program responsibilities. A weakness was noted in that a plan for reassignment of surveillance responsibilities was not developed prior to the reorganization. At the close of the SALP period, the surveillance program continued to function under the previously assigned coordination staff.

An unplanned outage was caused by pinhole steam leaks in a turbine cold reheat steam line. Two inadvertent Engineered Safety Features System actuations were caused as a result of surveillance activities (one due to personnel error and one due to inadequate procedure).

The licensee has experienced a significant problem with an increasing trend of low pressure steam line leaks/ruptures. These leaks have been apparently due to erosion of carbon steel pipe due to moisture saturated/low pressure steam. Although the licensee has devoted considerable effort toward prioritizing and conducting surveillance of pipe wall thickness and replacing thinned piping, the problem is not resolved and is possibly expanding. Many areas of piping have not yet been inspected and leaks continue to occur. A more aggressive program is needed to stay ahead of the problem.

In summary, procedures appear well stated, clear, conservative and rarely violated. The numbers of inadequacies were significantly reduced from the previous assessment period. Licensee policies required conservatism in entering and interpreting Technical Specifications. The surveillance program was effectively managed. A significant problem exists with erosion of steam piping.

2. Conclusion

Rating: Category 1.

Trend: Consistent.

3. Board Recommendation

Licensee:

A baseline survey of wall thickness of pipe susceptible to erosion should be conducted on a high priority basis.

NRC:

None.

E. Emergency Preparedness (211 hours, 4%)

1. Analysis

During the assessment period, there were two routine inspections. One inspection was observation of the full-scale emergency preparedness exercise on September 10, 1985. There were no violations or reportable events noted during the assessment period which related to the licensee's state of emergency preparedness.

Overall, the licensee has been responsive to most NRC initiatives and the findings indicate an acceptable level of performance in emergency preparedness. The emergency preparedness program was being maintained at its current state. Staffing and support for the program both at the site and from the corporate office were also maintained. Actions taken towards continued improvement consisted of:

(a) Establishment of a Dose Assessment computer surveillance program to improve system availability and reliability.

(b) A Quality Assurance program verifying validity of plant meteorological data.

(c) The Dose Assessment program (MIDAS) was changed to include an integrated dose calculation capability (allows totalizing sector doses in 15 minute intervals to enhance offsite dose calculations).

(d) An automatic telephone ring down circuit was installed in the control room to connect all applicable emergency centers.

(e) The onsite simulator now validates the drill scenario data.

Other program improvements are in progress or being sought, however, are not yet implemented.

Training deficiencies, however, were noted in that not all personnel had participated in the 1985 annual training program. A repetitive finding noted that the Radiological Assessment Director (RAD) inadequately assessed the use of potassium iodide.

In the area of dose assessment, the post-TMI action items III.A.22 on representative meteorological monitoring and refined dose calculations were still awaiting action. Coastal nuclear power plant sites need to address the complexity of wind flow patterns in the vicinity of the site. The MIDAS system (a family of computer codes for data acquisitions and dose assessment) was only used as a backup to both the manual dose calculations and verbal meteorological transfer of data to the EOF in the last emergency preparedness ex-

ercise. The licensee has recently installed the system in the Control Rooms, the TSC, and EOF to improve reliability and familiarity with the system.

These concerns were discussed with the licensee during the September 10, 1985 exercise, and were highlighted by the licensee in its self-critique, which was quite thorough. The licensee's performance during this exercise demonstrated their capability to protect public health and safety within the constraints of the scenario.

During the period, the inspector met with local officials who indicated favorable working relationships with the utility. Adequate resources and routine training to county emergency preparedness personnel were provided.

2. Conclusion

Rating: Category 1.

Trend: No basis.

3. Board Recommendation

Licensee

None.

NRC

None.

F. Security and Safeguards (288 hours, 5.5%)

1. Analysis

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

During this assessment period, three unannounced physical protection inspections were performed by regional based inspectors. Routine resident inspections continued throughout the assessment period.

Interviews of security force members and observations of program implementation during inspections throughout the assessment period indicated the licensee's commitment to implement a high quality security program and to maintain an effective security organization. This was evident by the licensee's continuing attention to program needs, prompt implementation of program enhancements, maintenance of an excellent training program, and interaction with other utilities regarding security matters.

Both plant and corporate management continue to exhibit a strong influence on the security program at Calvert Cliffs and in nuclear power industry plant security in general. This is demonstrated by the licensee's planning and budgeting for the gradual upgrading and/or replacement of security program related equipment by 1989. Additionally, key security management personnel are actively involved in the Region I Nuclear Security Association and other groups engaged in innovations in the nuclear plant security area.

The security staff supervisors were well trained, exhibited a professional demeanor and continued to provide effective supervision over other security force members. Other security force members were observed to perform their assigned duties in a professional, competent manner. Interviews with security force members revealed that they were encouraged to recommend improvements in the program matters they identified while carrying out their routine security duties.

The training department continued to provide dedicated instructors for security training and excellent support to the security organization. As part of security force training, the inspectors observed the licensee conduct very disciplined and professionally organized tactical contingency drills. Security force performance during drills demonstrated the effectiveness of this training and was further demonstration of the licensee's attention to the program and its commitment to quality.

During this assessment period, regional based inspectors advised licensee security management of generic findings as a result of Regulatory Effectiveness Reviews (RERs) conducted at other nuclear power plants. The licensee, on its own initiative, promptly implemented several enhancements to improve the effectiveness of its program. An RER was subsequently conducted at Calvert Cliffs during the assessment period. The results of that review indicated that the licensee's program met NRC security objectives. On matters identified during the RER which would provide easily achievable program enhancements, the licensee initiated prompt action. Other matters were promptly addressed and improvements were being considered even though the licensee had not received the RER team's report.

Three security event reports were submitted in accordance with the requirements of 10 CFR 73.71. Two involved isolated cases of personnel error, and the third was not specifically related to a decrease in security system effectiveness. Another event, identified by an inspector, involved an isolated error on the part of a plant employee, who was not a member of the security force. This event should have been reported under 10 CFR 73.71, but was not and a violation was cited. Yet another event, also identified by an inspector, involved equipment failure and required reporting to the NRC in accordance with the licensee's procedures and commitments. These latter two events are indicative of possible confusion in the licensee's event reporting procedures. All security events were properly responded to and appropriate compensatory security measures were implemented.

In summary, the Security Department was a well organized, professional and compentent group with excellent management support.

2. Conclusion

Rating: Category 1.

Trend: Consistent.

3. Board Recommendation

Licensee:

None.

NRC

None.

G. Refueling, Outage Management and Engineering Support (841 hours, 16%)

1. Analysis

The previous SALP identified staff training weaknesses in ASME code requirements regarding appropriate NDE testing requirements for electrical penetrations. An additional problem was noted in this area during this assessment period in that NDE equipment calibration procedures and recording criteria were found not to agree with ASME Section XI requirements. This indicated a need for additional training for personnel responsible for the review and approval of NDE procedures. Training was conducted. Because additional electrical penetration work of this nature has not been conducted, the effectiveness of the training has not been assessed.

Two refueling outages were conducted during the evaluation period (Spring 1985 for Unit 1 and Fall 1985 for Unit 2). Additionally, there were several unscheduled outages on both units. Outage activities observed by resident and regional inspectors included: outage coordination meetings, steam generator tube eddy current testing, replacement of salt water system heat exchanger channel heads, installation of reactor vessel level monitoring system, fuel loading, new fuel inspection, containment local and integrated leak rate testing, main steam isolation and safety valve maintenance, QC inspection activities, installation of reactor cavity seal and steam generator nozzle dams, outage radiological protection, In Service Inspections, and core loading verification.

Refueling outages were well planned and controlled. A strong effort was made to receive engineering design change packages on site at an earlier point to avoid last minute perturbations in outage resources and schedules. There was strict adherence to the schedule of activities, and good communication between licensee and contractor work groups. Daily outage meetings were attended by both corporate and site management. Those meetings were succinct and effective. The major portion of the fall outage was completed on or ahead of schedule.

The good practice of utilizing senior licensed operators to coordinate operations and maintenance activities was continued and further developed. This is now a permanent staff function (utilizing a shift supervisor) with an additional individual assigned during refueling outages. The recent reorganization centralized the outage coordination, operations-maintenance coordination, and the tagging functions into a single group within the operations department. Improvements were made in the scheduling/control of post maintenance testing.

The company reorganization late in the assessment period brought about major changes to the engineering area. Formerly, engineering functions were carried out by three major departments. Some functions were conducted out of the corporate office in Baltimore. These functions were consolidated into one department and will all be conducted at the plant site. This is expected to reduce coordination problems and minimize duplicate efforts. The licensee showed good planning in developing a transition program which anticipated losses of personnel due to job relocation and company reorganization. A good initiative was the licensee adoption of the systems engineer concept.

Within the engineering area, another good licensee initiative was the additional emphasis being placed on improvements in design checklists and documentation of facility changes (this effort was in part due to the identification of documentation deficiencies noted by a NRC Equipment Qualification inspection team) and increased involvement of design engineers in system walkdowns (as a way of reducing the number field engineering changes required).

To enhance shift staffing, an initial group of four engineers were undergoing a full time, 18 month training program leading to a senior operator license and Shift Technical Advisor (STA) qualification. Upon program completion those engineers will join the operations group on shift as STA's.

During the 1985 refueling outages, marked human factor improvements were made to control room panels. These included upgraded indicator/switch labeling, board mimic diagrams, demarkation of related instrument clusters, color coding, permanent information postings, and information on instrument response characteristics to losses of power. Additionally, the control boards were cleaned and painted.

As stated in the Chemistry and Radiological Functional Area, significant deficiencies were identified in the PASS system. In addition to the problems noted in that area, the licensee did not subject the implementation of PASS modifications to thorough or technically sound review or test procedures. This was indicative of a programmatic breakdown in the licensee's program for verifying and validating system performance. Further, in line analytical instruments and certain valves necessary to establish sample flow were inoperable. The dominant causal factor was a lack of strong overall managerial control to assure that sufficient priority and resources were provided for identification and correction of system problems.

A follow up inspection indicated that the deficiencies associated with PASS were an isolated case. That is, similar deficiencies did not exist with other NUREG-0737 modifications.

PASS is discussed in this section of the assessment because: (1) of the insufficient system testing noted above; (2) an understanding of what system constituted the "alternate" sampling method was not clearly communicated from the engineering organization to the plant; (3) the system was declared operable without procedures and training and (4) because it was representative of a problem the company recognized and was attempting to solve in the future through their development of the systems engineer concept. That is, the burden of solving this complicated system problem was placed on operating/maintenance line supervisors who are charged with many other responsibilities and who lacked sufficient technical support.

Two Equipment Qualification Inspections were conducted during the period. The NRC inspection team conducting the second inspection concluded that there was an apparent lack of management attention in the establishment of a viable EQ program. This was evidenced by the failure to take adequate corrective action for a deficiency identified during the previous EQ inspection (qualification of Rockbestos Coaxial Cable not established) and by the large number of potential enforcement/unresolved/open items identified during the follow up inspection.

Apparent weaknesses were noted in engineering support for the Instrument and Controls area. Specific indicators included: (1) a design error made in a modification to the Engineered Safety Features Logic Cabinets, (2) difficulty experienced by the licensee in designing a means for conducting in-cubicle testing of reactor trip breakers, and (3) long standing problems with Unit 2 main feedwater control circuitry.

2. Summary

In summary, routine outage activities were well planned and coordinated. A strong management influence was involved in decision making where significant repercussion may result. Good communication and orchestration of activities was demonstrated resulting in meeting schedules while minimizing rework and man-rem exposure.

Numerous upgrades of the plants were successfully made without complication. However, two areas, Post-Accident Sampling System and Environmental Qualification of Equipment lacked sufficient management attention.

Changes due to reorganization and development of the system engineer concept, as well as other recent program developments, prevented recurrence of problems where multi-disciplines required coordination of management support.

NRC involvement was necessary to identify deficiencies in the PASS and the Equipment Qualification program. The licensee should have recognized these problems through their own initiative.

3. Conclusion

Rating: Category 2.

Trend: No basis.

4. Board Recommendation

Licensee:

None.

NRC:

Schedule a meeting with the licensee to discuss licensee plans for better integration of engineering support into modification and outage activities.

H. Licensing Activities

1. Analysis

During the SALP evaluation period, the licensee continued to show good management overview in the area of licensing activities. The majority of the licensing actions completed during the SALP period were resolved within the licensing group at Calvert Cliffs (or via technical experts utilized by the licensing group). In the few instances where matters were referred to the licensee's upper management, these individuals proved to be well informed and helpful in resolving questions of a corporate nature. For example, the licensee's Vice President for Supply was directly involved in the resolution of the Radiological Effluent Technical Specifications (RETS) and problems associated with Post-Accident Sampling. The licensee's management also showed itself to be innovative and forward thinking. During the SALP period, the license (1) obtained a full 40 year operating license for Calvert Cliffs, Units 1 and 2; (2) worked diligently to establish an industry position on station blackout; and (3) requested a reduction in their emergency planning zone from 10 miles to 2 miles.

A summary of licensing activities is contained in Table 7. The licensee's submittals were usually timely and of high quality. Of particular note was the licensee's treatment of the "significant hazards consideration" standards of 10 CFR 50.92, "Issuance of Amendments." During the SALP period, the licensee substantially improved the way in which "significant hazards considerations" were addressed and now presents detailed safety analysis and plant-specific design information in addressing the standards of 10 CFR 50.92.

The licensee continued to maintain a significant technical capability in almost all engineering and scientific disciplines necessary to resolve items of concern to the NRC and the licensee. The licensee continued to utilize the services of Combustion Engineering for accident analysis. However, the licensee was improving its accident analytic capability and had submitted a request for review and approval of the RETRAN model for Calvert Cliffs. The NRC also benefited from the licensee's technical capabilities as a result of NRC's request for comments and/or participation in the following:

-- Seismic Qualifications of Equipment (USI A-46)

-- Safety Implications of Control Systems (USI A-47)

-- Pressurized Thermal Shock (USI A-49)

The licensee continued to respond promptly to all NRC staff initiatives. During the SALP period, the licensee assisted the NRC in resolving a number of multi-plant (generic) items and TMI Action

items. In each case, the licensee carefully evaluated the item in question to assure the degree of applicability to Calvert Cliffs. Where requirements were generic rather than plant-specific, the licensee diligently negotiated changes in requirements to assure that the final requirements (e.g., Technical Specifications or equipment design) fully reflect the Calvert Cliffs plant design. In some cases, the licensee's upper management was involved in final negotiations. In all cases where the licensee's position did not meet the final NRC position, the licensee changed their position to achieve conformance.

During the SALP period, one enforcement action was directly related to licensing activities. The subject enforcement resulting from the inadequacy of the post accident sampling system (PASS). This action was significant from a licensing standpoint in that the TS was proposed for an unproven system and the licensee should not have proposed the TS until the PASS had been shown to be reliable. Section G, "Refueling, Outage Management, and Engineering Support," presents additional details on this issue.

In summary, the licensee's licensing activities were conducted by a well staffed and well trained group resulting in an overall efficient operation. Management overview was obvious in that the licensing group was, for the most part, well integrated into other plant activities and licensing activities reflected a uniform approach. Upper management became directly involved in licensing actions only rarely to assist in resolving potential deadlocks. The licensee is to be commended for the diligent way in which multi-plant (generic) and TMI Action Items were resolved and the willingness of the licensee to compromise when necessary to achieve agreement with NRC positions.

2. Conclusion

Rating: Category 1.

Trend: Consistent.

3. Board Recommendation

Licensee:

None.

NRC:

None.

I. Assurance of Quality

1. Analysis

During this assessment period, management involvement and control in assuring quality is being considered as a separate functional area for the first time and continues to be one evaluation criterion for each functional area. The various aspects of Quality Assurance Program requirements have been considered and discussed as a integral part of each functional area and the respective inspection hours are included in each one. Consequently, this discussion is a synopsis of the assessments relating to quality work conducted in other areas. However, it is not solely an assessment of the QA/QC departments.

The licensee has dedicated significant resources and emphasis to the assured quality of their work, and emphasizes that quality is a line function. Increased emphasis was placed on assessing effectiveness of plant programs. For example, early in the SALP period, licensee management effectively used QA personnel to perform an in depth auditing effort to identify administrative and technical deficiencies in surveillance test procedures (STP's). The Quality Control staff was extensively involved in monitoring corrective maintenance, surveillance testing, and modification activities.

The effectiveness of the licensee's QA organization was shown by the identification of improper vendor substitutions of non-safety grade air filters for safety grade filters.

QC coverage of both primary and secondary maintenance and surveillance activities was noted to be extensive.

Routine audits performed by the QA staff were well planned and thorough, and audit findings were resolved within a reasonable time frame. However, audit findings have routinely appeared to be minor in nature with little impact on the specific program. Audits were only of tradational areas/departments and generally did not assess nor "second guess" management/POSRC decisions. Audits were often quite superficial and presented additional paperwork and a burden to various departments with several "nits" rather than identifying real problems, attempting to identify the root cause(s), and providing appropriate recommendations.

Management and the onsite review and offsite review committees were not effective in their reviews to assure quality in the acceptance of the Post Accident Sampling System considering the many problems associated with it, and in the inadequate maintenance of the Environmental Qualification of components. The Plant Operation and Safety Review Committee was often less than effective in implementing their role as a safety committee to ensure understanding of root

causes of several plant trips (see Maintenance functional area). Considerable NRC attention was required prior to the licensee initiating adequate action regarding several potential safety issues (see Operations functional area). Quality in the initial decisions for corrective action was not effective in preventing recurrence of loss of shutdown cooling, feed pump/reactor trips, feedwater heater level/reactor trips, and repetitive shutdowns due to main steam isolation valve problems (see Table 6).

Independent of the above, as a result of a licensee reorganization, major changes were made (late in the period) which are indicative of effort to improve the quality effectiveness as follows:

(1) To provide greater depth of insight, a pilot program was implemented using senior licensed individuals (of the operations department and currently assigned to shifts) to conduct QC surveillances of operational activities. A similar program was implemented in the chemistry area.

(2) QC personnel were transferred from the QA department to line departments (however, they remained as separate groups within those departments to preserve independence). This was done to provide more effective (less adversarial) working relationships between QC and line personnel. The licensee wanted to provide the line departments with an improved tool to ensure work was being accomplished correctly under the philosophy that quality is a line function. Enhanced cross training programs for QC and line groups was initiated.

(3) QC controls are now being provided for selected non-safety related maintenance activities.

(4) Efforts were made to improve audit effectiveness by increased QA supervisor participation in audit planning and review and by making audits more technical in nature.

(5) Audits similar in nature to recent NRC IDI and PAT team inspections are planned.

(6) Material receipt inspections will be expanded to include increased dimensional checks of parts.

(7) The QA staff was strengthened by the addition of a General Supervisor with previous experience as the General Supervisor of Operations. Additionally, a senior licensed engineer was added to the staff.

(8) The practice of conducting audits of areas of special concern to licensee management was continued (e.g. compliance of NUREG 0737 requirements, Reactor Coolant Pump overhaul activities).

In summary, although an extensive quality program existed throughout the organization, the visible contribution incorporating quality in the important safety issues appears lacking. Quality effectiveness was also limited in the line functions, specifically in the I&C area, resulting in numerous plant trips. New initiatives were implemented in this area late in the assessment period.

2. Conclusion

Rating: Category 2.

Trend: No basis.

3. Board Recommendation:

Licensee

None.

NRC

None.

J. Training and Qualification Effectiveness

1. Analysis

Although attributes of this topic are discussed in each SALP functional area, the topic here is segregated because of its importance, and to provide a synopsis of the effectiveness of the training and qualification programs. Training effectiveness was measured primarily by the observed performance of licensee personnel and, to a lesser degree, by reviews of program adequacy. The discussion below addresses three principle areas: licensed operator training, non-licensed staff training, and the status of INPO training accreditation.

INPO accreditation for the site was scheduled for completion by the end of June 1986. Three operator training programs and health physics and chemistry were approved by the end of the assessment period. Instrument and Controls, maintenance electricians and the STA programs were submitted in January 1986. The final two programs for mechanical maintenance and the technical staff were due to INPO by June 30, 1986.

Effectiveness of training for most departments was good as evidenced by few personnel errors, a low man rem dose rate and timely assessment and response to abnormal occurences by plant operators. Training in the Maintenance Mechanical area was less than effective. A lack of engineering support to provide torque specifications resulted in over torquing pressurizer spray valve fasteners. Many components may remain over torqued because of the duration of the maintenance program without appropriate training in this area. Maintenance training was also noted to be lacking with respect to rebuilding Reactor Coolant Pump Seals when the resident inspector observed a component being installed backwards.

Other areas where training was provided but appeared less than effective was within the Instrument and Controls Department. Training appeared comprehensive and attendance was good. Facilities and support appeared appropriate. However, several personnel errors were noted where technicians failed to follow procedures causing a loss of shut down cooling, recirculation actuation signals, and other Emergency Safety Feature actuations. Additionally, several plant trips occurred due to grounds on control systems or undetermined causes associated with control mechanisms which instrument and controls troubleshoots often unsuccessfully.

Reviews of training for non-licensed staff indicated that great strides were being accomplished in an area where significant weaknesses were noted in licensee's prior performance related to maintenance technical training. The licensee recognized the maintenance department's previously weak training program and, as part of the

site effort to become INPO accredited, included considerable specialized training improvements for reactor coolant pump seal replacement, rebuilding safety valves, control valves and actuators, fasteners and coupling and machinery alignment. (Problems in these areas in the past led to unit shut downs or aggravated operations.) A machinery mechanic training and qualification program was developed bringing a formalized qualification program for levels 1, 2, and 3 mechanics. This ensured a formal base line knowledge in basic math, plant systems, print reading, first aid and radiological safeguards type material for all personnel. Equipment maintenance qualifications, with courses provided for each type of valve, pump, compressor, and actuator within the plant up to level 3 training on reactor assembly/disassembly, governors, diesel generator equipment and electrohydraulic controls were also provided. Schedules provide for classroom, laboratory, on the job, and recurring training. These qualification programs were or were being developed for each area within the maintenance department, health physics and operations.

In addition to the recent task analysis, procedure development and qualification program, the licensee dedicated significant hardware resources to training beginning with the site specific simulator primarily for licensed operators. Both the maintenance electricians and instrument and control had training laboratories with state of the art training aids provided. Functional laboratories were provided for health physics and chemistry and maintenance. Mockups were provided for steam generator primary side man ways, reactor coolant pump seal and various valves.

Although the licensee recognized and implemented corrective action for the previously marginal training in the maintenance area, and supplemented the training programs of other areas with INPO accreditation, the effects of the accreditation were yet to be seen.

Discussions with licensed operators reflected little knowledge of probablistic risk assessment. Operators were not cognizant of systems/components that are significant risk contributors or what possible effects working on these systems/components might have.

In summary, training programs were in place and were being upgraded with INPO accreditation nearly complete. Appropriate resources and management attention were dedicated. Significant improvements were made in the previously weak maintenance program, however effectiveness of improvements was yet to be seen.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Board Recommendation

Licensee

None.

NRC

None.

V. SUPPORTING DATA AND SUMMARIES

A. Investigations and Allegations Review

During this assessment period three allegations were received. Two alleged adverse background information for (2) contractor employees. This information was provided to the licensee for further investigation. Information gained from follow on investigation led to the removal of site access for one of the individuals. In the second case, the licensee determined no action was necessary.

The third allegation, regarding an improper entry into high radiation areas, was received near the end of the SALP period and was still under review.

Inspector effort was continued on five allegations made by a single worker at the end of the previous SALP period, which stated that improper administrative control actions caused the worker to receive a radiation exposure in excess of regulatory limits. The allegations were partially substantiated and two violations were issued.

An investigation was conducted by the Office of Investigations regarding improper vendor substitution of commercial grade HEPA filters for safe grade filters.

B. Escalated Enforcement Actions

1. Civil Penalties

One civil penalty was issued on September 26, 1985 resulting from identification of significant deficiencies in the Post Accident Sampling System (PASS).

2. Orders

None.

3. Confirmatory Action Letters

None.

C. Management Conferences Held During the Assessment Period

A management meeting (July 11, 1985) and, subsequently an enforcement conference (August 14, 1985) was held regarding deficiencies in the PASS System.

D. Licensee Event Reports (LERs)

Tabular Listing

TYPE OF EVENTS		Unit 1	Unit 2
A.	Personnel Error	4	3
B.	Design/Man.Constr./Install	6	2
C.	External Cause	2	1
D.	Defective Procedure	5	0
E.	Component Failure	3	5
X.	Other	2	6

Total . .39

Licensee Event Reports Reviewed:

Report Nos. 317/84-13 through 86-02; and 318/84-08 through 86-03.

TABLE 1

INSPECTION REPORT ACTIVITIES

UNIT 1/UNIT 2 REPORT NUMBERS	INSPECTION HOURS	AREAS INSPECTED
84-26/84-26	108	IE Bulletins 79-02, 79-04, 79-07, and 79-14
84-27/84/27	289	Equipment Qualification
84-28/84-28	32	Chemistry
84-30/84-30	40	Operator Examination
84-31/84-31	169	Routine Resident
84-32/84-32	44	Radiation Protection Program
85-01/85-01	214	Routine Resident
85-02/85-02	238	Routine Resident
85-03/85-03	0	Cancelled
85-04/85-04	81	Non-License Training and QA Program
85-05/85-05	28	Radiation Protection Pre-Outage
85-06/85-06	56	Environmental Protection Program and Training
85-07/85-07	220	Routine Resident
85-08/85-08	68	Physical Security
85-09/85-09	259	Routine Resident
85-10	67	Containment Leakage Testing Program
85-11	37	In Service Inspection
85-12/85-10	50	Radiation Protection
85-13/85-11	120	Routine Resident
85-14/85-12	64	Radiation Environmental Monitoring
85-15/85-13	272	Routine Resident

UNIT 1/UNIT 2 REPORT NUMBERS	INSPECTION HOURS	AREAS INSPECTED
85-16/85-14	190	TAP PASS, Effluent Monitors
85-17/85-15	20	Radiation Safety
85-18/85-16	180	PASS
85-19/85-17	64	Radioactive Liquid and Gaseous Effluent Program
85-20/85-18	0	Enforcement Conference
85-21/85-19	0	Cancelled
85-22/85-20	245	Environmental Qualification
85-23/85-23	40	Operator Examinations
85-24/85-21	210	Routine Resident
85-25/85-22	190	Emergency Preparedness
85-26/85-24	41	Safeguards
85-27/85-25	56	Radiation Protection Pre-Outage
85-28/85-28	237	Routine Resident
85-29/85-30	33	Transportation
85-31	42	Refueling Activities
85-30/85-32	186	Routine Resident
85-31/85-26	31	Radiation Protection
85-32/85-27	190	Operator Requalification Program
85-33/85-33	126	Local Leak Rate Tests and Integrated Leak Rate Tests
85-34/85-34	185	Routine Resident
85-35/85-35	29	Radiation Protection
86-01/86-01	49	IE Bulletin 80-11, Masonry Wall Design
86-02/86-02	68	Dosimetry Inspection

UNIT 1/UNIT 2 REPORT NUMBERS	INSPECTION HOURS	AREAS INSPECTED
86-03/86-03	136	Routine Resident
86-04/86-04	32	Physical Security
86-07/86-07	220	Routine Resident
TOTAL HOURS	5258	

TABLE 2

INSPECTION HOUR SUMMARY (10/1/84 - 4/30/86)

		HOURS	% OF TIME
1.	Plant Operations.....	1295	24.6%
2.	Chemistry and Radiological Controls.....	901	17.0%
3.	Maintenance.....	837	16.0%
4.	Surveillance.....	885	16.8%
5.	Emergency Preparedness.....	211	4.0%
6.	Security and Safeguards.....	288	5.5%
7.	Refueling.....	841	16.0%
8.	Licensing Activities.....	NA	NA
9.	Assurance of Quality.....	NA	NA
10.	Training and Qualification Effect.....	NA	NA
	TOTALS	5258	100%

TABLE 3

VIOLATIONS (10/1/84 - 4/30/86)

A. Number and Severity Level of Violations

Severity Level I	0
Severity Level II	0
Severity Level III	2
Severity Level IV	14
Severity Level V	4
Total Violations	20

B. Violations Vs. Functional Area

Functional Areas	Severity Levels I	II	III	IV	V
1. Plant Operations			1	4	2
2. Chemistry and Radiological Controls				4	1
3. Maintenance					
4. Surveillance				2	1
5. Emergency Preparedness					
6. Security and Safeguards				3	
7. Refueling, Outage Management, and Engineering Support			1	1	
8. Licensing Activities			–	—	–
Totals			2	14	4
Total Violations				20	

C. Summary

Inspection Number	Inspection Dates	Requirements	Severity Level	Area	Subject
317/318					
84-26/82-26	10/1-5/84		Dev.	Refuel	Piping systems identified as Reactor Coolant and the pressurizer surge lines had not been inspected and verified for agreement with corresponding seismic analysis on Calvert Cliffs Units.
84-32/84-32	11/26-30/84	TS 6.8	IV	Rad	Failure of workers to comply with Special Work Permit
85-01/85-01	12/18/84-1/22/85	TS 6.12	IV	Rad	Failure to Post High Radiation Area in Five Foot West Penetration Area.
85-09/85-09	4/1-5/6	TS 3/4 9.3.9.3	V	Ops	Source Range Nuclear Flux Monitor was not Audible in the Control Room.
85-13/85-11	5/6-6/17	TS 6.8.1a	IV	Ops Surv	Two instances of personnel failure to follow procedures resulted in: U1 Shutdown Cooling Flow Loss when RCS Pressure Increased Above 284 PSIA; Two of Four U2 RWT Level Switch Channels were Tripped at one time during STP M-220-2.

Inspection Number	Inspection Dates	Requirements	Severity Level	Area	Subject
85-16/85-14	6/24-6/28	NRC Order TS 3.7.13	III III	Refuel Ops	Significant deficiencies associated with PASS, e.g. inadequate testing, design, train-procedures. Inadequate protective sleeving (EQ) for in-containment hi range radiation monitors. Missed surveillance testing on main vent iodine and particulate sampler.
85-18/85-16	7/16-7/26	NRC Order TS 4.3.3. TS 6.15	IV IV IV	Refuel Surv Ops	
85-17/85-15	7/1-3/85	10 CFR 20.201	IV	Rad	Worker received radiation dose higher than allowed for condition where NRC Form 4 not completed.
		10 CFR 20.201	IV	Rad	Improper reporting of above event.
86-03/86-03	1/20-3/3	TS 3.6.4.1	IV	Ops	U1 1-SV-6529 Discovered to be Open Without Administrative Control. (Containment Isolation Valve).
86-04/86-04	2/18-21/86	Sec. Plan	IV	Sec.	Failure to check an alarm.
		Sec. Plan	IV	Sec.	Failure to report.
86-05/86-05	3/3-7/86	TS 6.8.1	V	Rad	Procedure for stand up whole body counter not properly approved.
		TS 4.6.3.1	IV	Surv	Inadequacy in lab analysis program for charcoal absorber material.

Inspection Number	Inspection Dates	Requirements	Severity Level	Area	Subject
86-07/86-07	3/4-4/30	10 CFR 50	V	Surv	Unit 1 High Pressure Safety Injection Pump Discharge Pressure gauge inadequate for use, (out of calibration) to demonstrate functional acceptance of safety systems.
		10 CFR 50	V	Ops	Installed instrument not tagged or labelled indicating date of calibration or identify of person performing calibration.
		10 CFR 50 App B	IV	Ops	Post maintenance test accomplished by procedures not appropriate to the circumstances resulting in inadvertent isolation of Unit 2 shut down cooling system. Ineffective corrective actions following earlier events led to recurring losses of shut down cooling.
		Sec. Plan	V	Sec	Security violation.

TABLE 4

TABULAR LISTING OF LERS BY FUNCTIONAL AREA

AREA		NUMBER/CAUSE CODES					
1.	Plant Operations	4/A	0/B	3/C	0/D	0/E	0/X
2.	Chemistry and Radiological Controls	0/A	0/B	0/C	0/D	0/E	0/X
3.	Maintenance	1/A	4/B	0/C	3/D	7/E	3/X
4.	Surveillance	2/A	4/B	0/C	2/D	1/E	5/X
5.	Emergency Preparedness	0/A	0/B	0/C	0/D	0/E	0/X
6.	Security and Safeguards	0/A	0/B	0/C	0/D	0/E	0/X
7.	Refueling, Outage Management and Engineer Support	0/A	0/B	0/C	0/D	0/E	0/X
8.	Licensing Activities	0/A	0/B	0/C	0/C	0/E	0/X

Cause Codes		U1	U2	Total
A.	Personnel Error	4	3	7
B.	Design/Man./Const.Install.	6	2	8
C.	External Cause	2	1	3
D.	Defective Procedure	5	0	5
E.	Management/Quality Assurance Deficiency	3	5	8
X.	Other	2	6	8
	Totals	22	17	39

TABLE 5

LER SYNOPSIS

LER NUMBER	SUMMARY DESCRIPTION
UNIT 1	
84-13	Loss of Circulating Water Caused by Sea Nettle Impingement
84-14	Battery Inoperable
84-15	Loss of Circulating Water Caused by Sea Nettle Impingement
84-16	HPSI Injection Leg's Flow Imbalanced
84-18	#11 MSIV Inoperable
84-19	Failure of #12 MSIV to Fully Close during Surveillance
85-01	Excessive Safety Injection Tank Check Valve In Leakage
85-02	Reactor Trip on Low Steam Generator Water Level Condition Resulting from a Temporary Loss of Main Feed Water
85-03	MSIV Setpoints Out of Tolerance
85-04	ESFAS Occurred During Surveillance Testing with Unit in Mode 4
85-05	Inadvertent Initiation of Steam Generator Isolation
85-06	UGS Removal Without Fuel Handling Supervisor Present
85-07	HPSI Injection Leg's Flow Imbalanced
85-08	Reactor Trip Caused by Moisture Separator High Level
85-09	Reactor Trip on Low Steam Generator Water Level
85-10	Reactor Trip caused by Improperly Set Main Turbine Thrust Bearing Wear Detector
85-11	Main Turbine Trip Due to an Undetermined Cause
85-12	Main Turbine Trip Due to a Grounded Feed Water Heater Level Control Switch
85-13	RCP Shaft Seal Bleed Off Line Weld Failure
85-14	Control Room Ventilation Damper Failure

LER NUMBER	SUMMARY DESCRIPTION
86-01	Reactor Trip Caused by Failure of TCB #2 During Surveillance Testing
86-02	Inadvertent Closing of Shutdown Cooling Return Valve
Unit 2	
84-08	Reactor Trip Due to Loss of #22 Main Feed Water Pump. Cause Unidentified.
85-01	Manual Trip Caused by Degradation of #21A Reactor Coolant Pump Shaft Seal
85-02	Reactor Trip Caused by an Inadvertent Actuation of #21A RCP Over Current Device
85-03	Incorrect Fastener Material used in Pressurizer Spray
85-04	Control Room Post LOCI Filter System Inoperable
85-05	Recirculation Actuation Signal Inadvertent Initiation
85-06	Inoperable Diesel Generators
85-07	Failure to Perform Required Surveillance on Noble Gas Monitor
85-08	Failure of #21 MSIV to Fully Close during Surveillance Testing
85-09	Blockage of Saltwater Flow to Service Water Heat Exchanger #21
85-10	Pressurizer Safety Valve Setpoint Out of Specification
85-11	Main Steam Safety Valve Set Points Out of Specification
85-12	Reactor Trip on Low Steam Generator Water Level
85-13	Inadvertent Initiation of Engineered Safety Features During Mode 6
86-01	Violation of TS for Pressurizer Over Pressure Protection during Cold Shutdown Conditions
86-02	Inadvertent Trip of Main Turbine from Engineering Safety Features Actuation System
86-03	Inadvertent Engineered Safety Features Actuation Due to Failed Logic Module

TABLE 6

UNPLANNED AUTOMATIC TRIPS AND FORCED OUTAGES

UNIT	DATE AND POWER LEVEL	DESCRIPTION	CAUSE
1	10/2/84 100%	Manual trip following accumulation of jelly fish on intake structure screens, to avoid damage to screens and circulating water pumps and low condenser vacuum condition.	Design.
2	10/3/84 92%	Unit tripped on low steam generator water level due to loss of #22 main feed water pump. The exact cause of pump trip could not be determined but was believed to originate in the automatic speed control circuitry.	FW control prob-problems (possibly due to grounds).
1	11/20/84 100%	Manual trip following accumulation of jelly fish on circulating water screens, to avoid damage to screens and circulating water pumps and low condenser vacuum conditions.	Design
1	12/12/84 100%	Controlled shutdown due to a concern that #11 Main Steam Isolation Valve might be in inoperable.	Equipment problem (possible design/maintenance related).
1	01/16/85 100%	Controlled shutdown to repair Safety Injection Tank check valve leakage.	Possible maintenance deficiency.
1	02/01/85 100%	Reactor trip on low steam generator water level following loss of both main feed water pumps (MFWP). MFWP trips were caused by operator error in mistakenly opening a control power breaker.	Miscommunication between operator and control room.
2	04/25/85 100%	Precautionary manual trip by operator due to failed Reactor Coolant Pump seal.	Precautionary trip.
2	05/05/85 55%	Reactor trip on low reactor coolant flow due to loss of Reactor Coolant Pump #21A.	Random failure.
2	05/17/85 100%	Precautionary shutdown to inspect and replace pressurizer spray valve fasteners.	Precautionary (to correct maintenance problem).
2	07/18/85 100%	Controlled shutdown to repair two pin hole size steam leaks on a cold turbine reheat line.	Weak BOP surveillance.

UNIT	DATE AND POWER LEVEL	DESCRIPTION	CAUSE
1	08/06/85 17%	Reactor trip due to turbine trip as a result of high level in Moisture Separator Reheater (mispositioned isolation valve).	Personnel error.
1	08/06/85 28%	Trip due to low steam generator water level due to operator difficulties in manually maintaining steam generator level with positive moderator temperature coefficient.	Personnel error.
1	08/07/85 50%	Reactor trip caused by turbine trip due to improper alignment of thrust bearing wear detector.	Maintenance or design.
1	09/30/85 100%	Reactor trip caused by turbine trip due to ground in feed water heater level circuit.	Maintenance.
1	10/02/85 100%	Reactor trip caused by turbine trip due to continuing ground in feed water heater level circuit.	Continuing maintenance problem.
1	10/09/85 100%	Controlled shutdown due to cracked weld on Reactor Coolant Pump bleed off line.	Design or bad weld.
2	12/12/85 46%	Trip on low steam generator water level due to loss of #21 Main Feed Water Pump due to faulty control circuitry.	FW control problems (possibly due to grounds).
1	01/13/86 100%	Reactor trip due to malfunction of a Reactor Trip Breaker during surveillance testing.	Manufacturing error.
2	02/04/86 100%	Reactor trip caused by turbine trip.	Apparent spurious SG high level signal.

TABLE 7

SUMMARY OF LICENSING ACTIVITIES

1. NRR LICENSEE MEETINGS

March 27, 1986	Reactor Coolant System High Point Vent Technical Specifications
December 13, 1985	Main Steam Line Safety Valves - Setpoint Problems
September 7, 1985	Control of Heavy Loads
August 26, 1985	Post-Accident Sampling System
July 10, 1985	Containment Purge and Vent Valves
April 24, 1985	Masonry Wall Evaluation
March 20, 1985	Reactor Coolant Pump Seal Cooling

2. NRR SITE VISITS

March 20, 1986	Security Retraining and Inspect Plant Housekeeping
January 27-31,1986	Inspection of Boric Acid Subsystem
December 5, 1985	Inspect Plant Housekeeping
Sept. 23-26, 1985	Inspect Spent Fuel Pool Cooling System
August 26, 1985	Control Room Habitability Inspection
July 19, 1985	Post-Accident Sampling System Inspections (exit interview)
June 24, 1985	Security Retraining and Inspect Plant Housekeeping
April 4, 1985	Inadequate Core Cooling Instrumentation Inspection
February 8, 1985	Inspect Plant Housekeeping
January 16, 1985	Inspect MSIVs and Obtain Data on Recent Failures

3. COMMISSION BRIEFINGS

None.

4. SCHEDULAR EXTENSIONS GRANTED

March 31, 1985	Environmental Qualifications Schedule Extension

5. RELIEFS GRANTED

April 18, 1985	ASME Code - Common start for Calvert Cliffs Units 1 and 2 Programs
May 20, 1985	ASME Code - Pressurizer Spray Line Inspection
September 18, 1985	ASME Code - Reactor Coolant Pump Weld Inspection
November 14, 1985	ASME Code - System Pressure Tests
March 10, 1986	ASME Code - Pump Tests

6. EXEMPTIONS GRANTED

January 8, 1986	Appendix J to 10 CFR Part 50 - ISI/ILRT Schedule

7. LICENSEE AMENDMENTS ISSUED

April 14, 1986	License Amendments 117 and 99 - Miscellaneous TS Changes (applications dated February 22, 1985 and October 25, 1985)
March 31, 1986	License Amendment 116 (Unit 1) - Incore Detector TS
February 20, 1986	License Amendments 115 and 98 - Containment Vent TS
February 19, 1986	License Amendments 113 and 96 - Post Accident Sampling System TS
January 8, 1986	License Amendments 112 and 95 - ILRT/ISI Schedule
December 31, 1985	License Amendments 111 and 94 - Diesel Generator TS
December 30, 1985	License Amendments 110 and 93 - Organizational Charts
December 9, 1985	License Amendments 109 and 92 - Miscellaneous TS Changes (application dated April 26, 1985)
December 4, 1985	License Amendments 108 and 91 - Miscellaneous TS Changes (application dated June 28, 2985)
November 21, 1985	License Amendment 90 - (Unit 2) Cycle 7 Reload
August 30, 1985	License Amendment 89 - (Unit 2) TS Changes in Support of cycle 7 Reload

August 26, 1985	License Amendments 107 and 88 - TS for TCS Leakage
August 1, 1985	License Amendments 106 and 87 - Alternate STA Qualifications
July 1, 1985	License Amendments 105 and 86 - RETS (Effluent Monitoring)
May 20, 1985	License Amendment 104 - (Unit 1) Cycle 8 Reload
May 16, 1985	License Amendments 103 and 85 - Miscellaneous TS Changes (applications dated September 20, 1984 and January 31, 1985)
May 1, 1985	License Amendments 102 and 84 - License Expiration Dates
March 7, 1985	License Amendments 101 and 83 - Revised TS for Halon Systems
February 22, 1985	License Amendments 99 and 81 - GL 83-37 (TS for TMI Action Items)
February 14, 1985	License Amendments 98 and 80 - ILRT Schedule
January 14, 1985	License Amendments 97 and 79 - Miscellaneous TS Changes (applications dated April 9, 1984 and June 29, 1984)

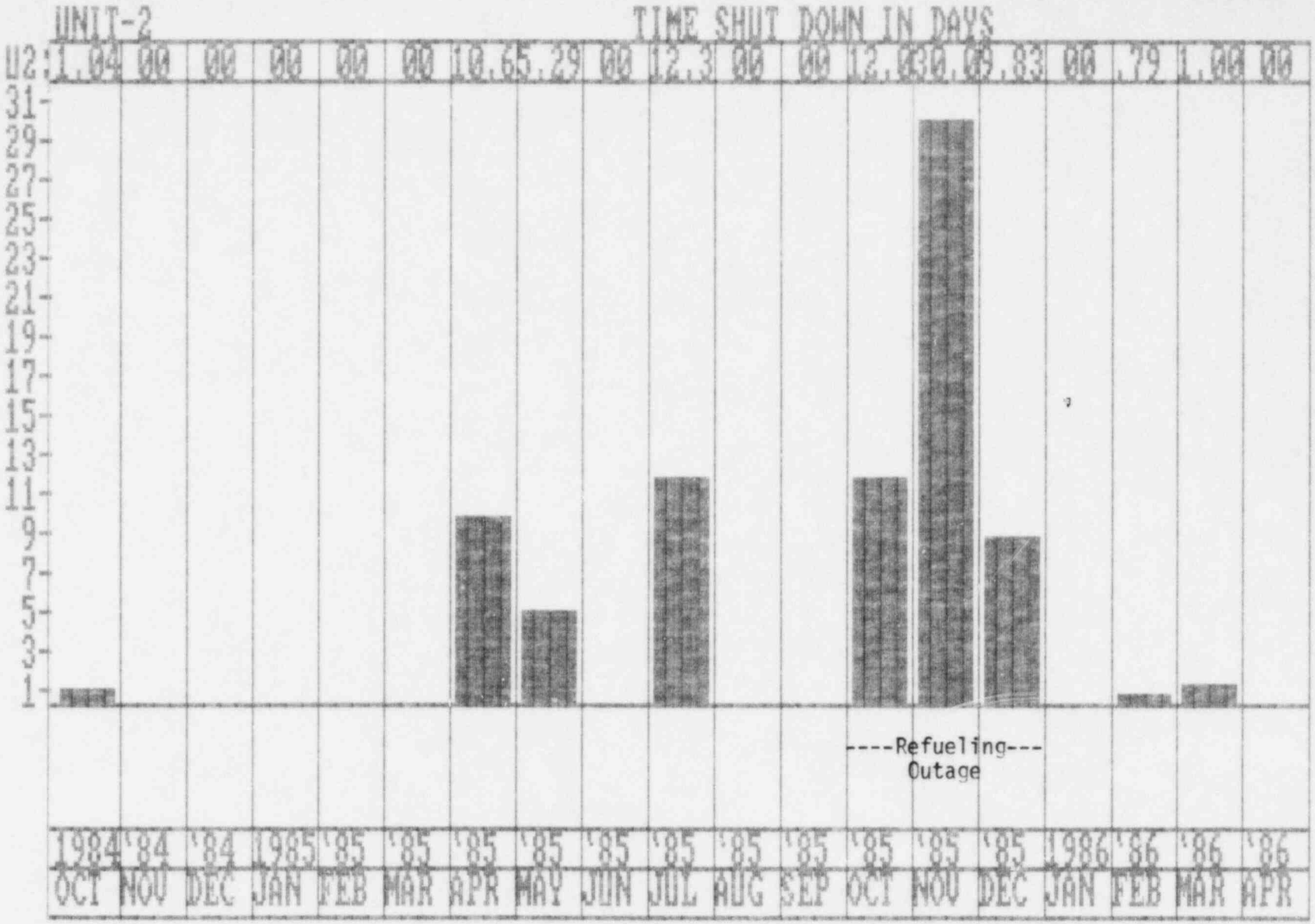
8. EMERGENCY TECHNICAL SPECIFICATIONS ISSUED

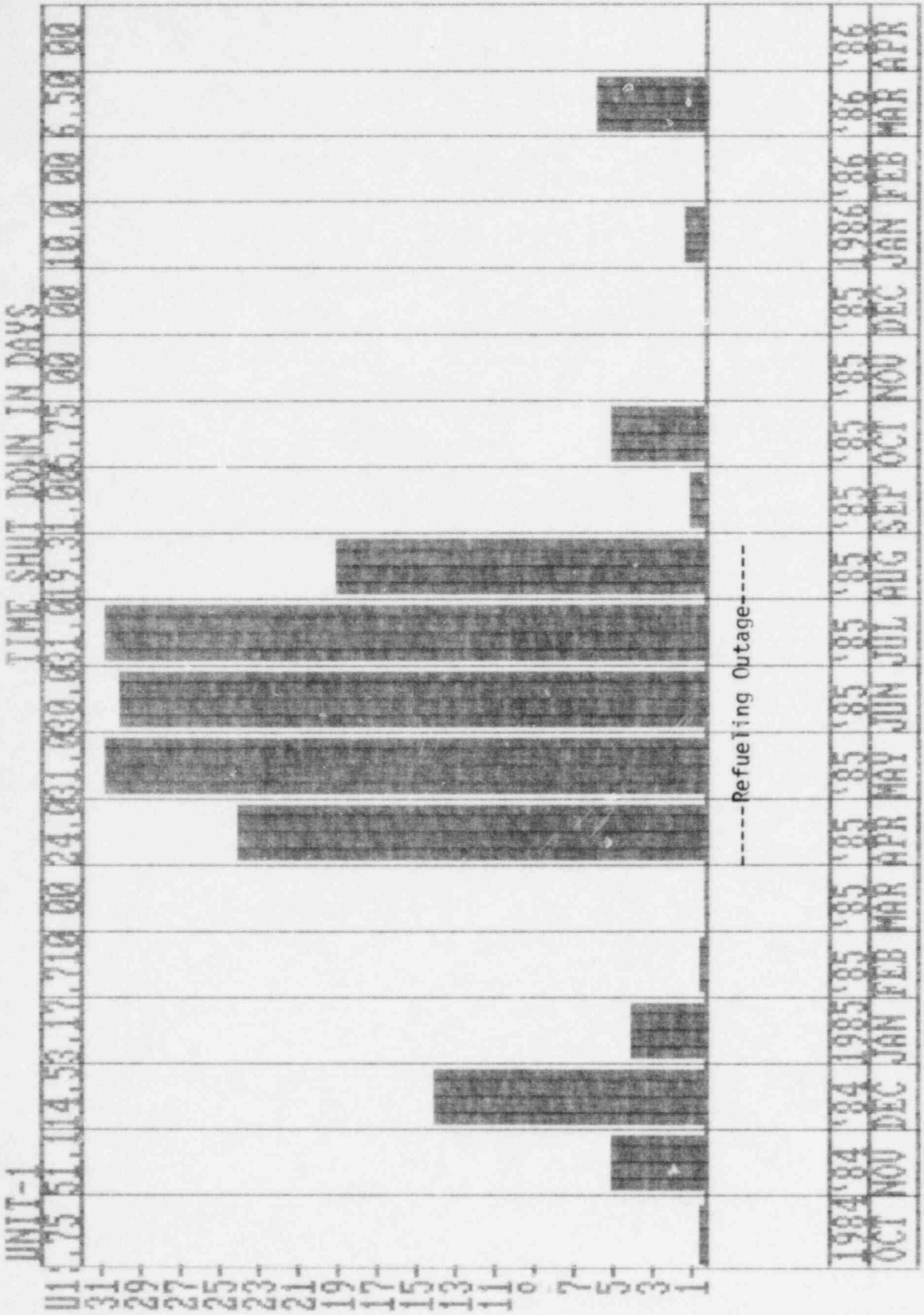
None.

9. ORDERS ISSUED

July 16, 1985 Order Modifying License Confirming Additional Licensee Commitments on Emergency Response Capability (Supplement 1 to NUREG-0737)

ATTACHMENT 1

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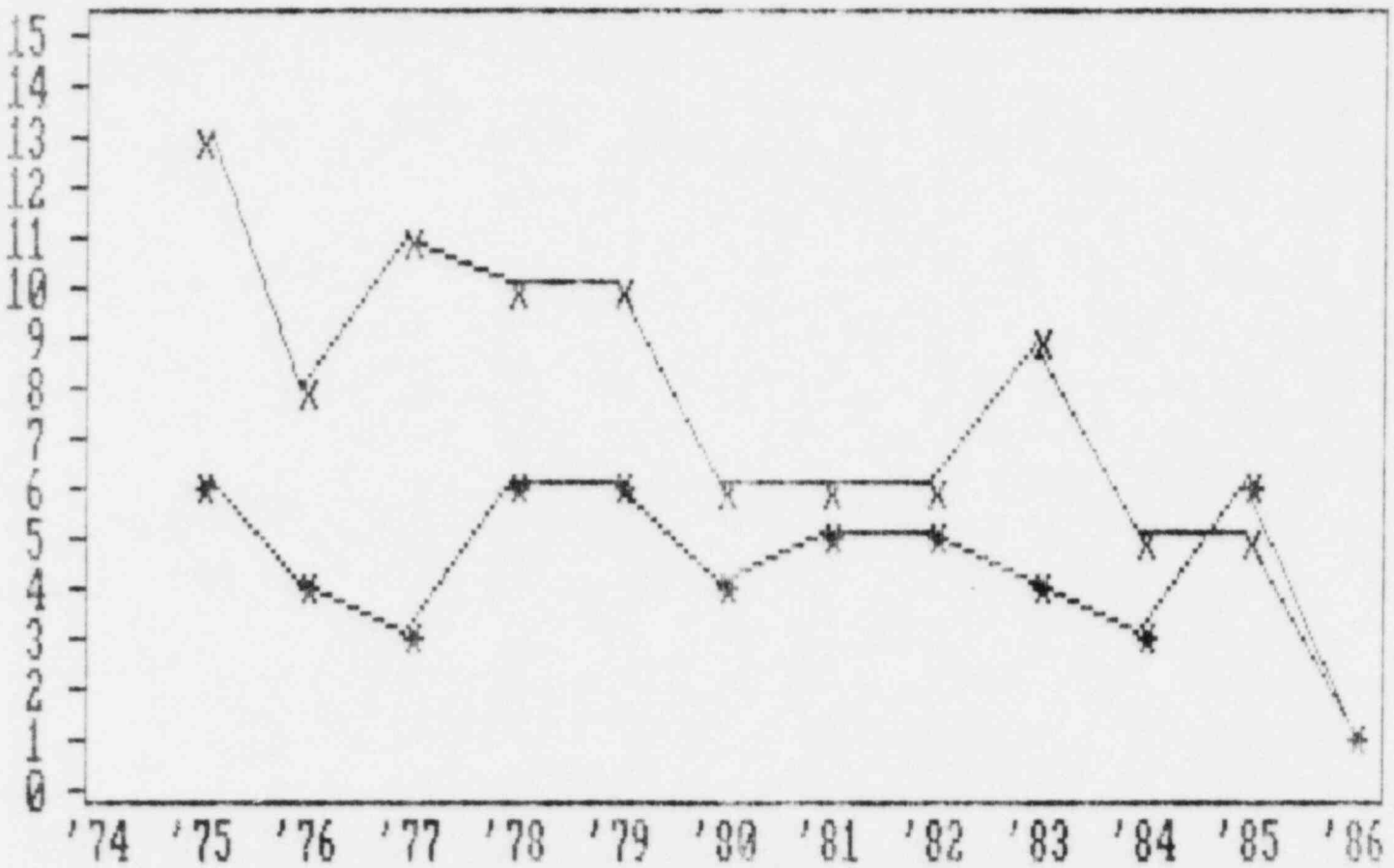
TIME SHUT DOWN IN DAYS
.75 51.00 14.53 17.71 0.00 24.03 1.30 0.03 1.01 9.31 0.05 .75 0.00 0.00 10.00 6.50 0.00
U1
31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1
-----Refueling Outage-----
1984 '84 1985 '85 '85 '85 '85 '85 '85 '85 '85 '85 '85 '85 '85 '85 '86 '86 '86 '86
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR

ATTACHMENT 2

TOTAL NUMBER OF SHUTDOWNS & TRIPS PER YEAR
SINCE STARTUP



TOTAL NUMBER OF SHUTDOWNS & TRIPS PER YEAR
SINCE STARTUP