ENCLOSURE

SALP BOARD REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NO. 50-277/87-99
50-278/87-99

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION

UNITS 2 AND 3

ASSESSMENT PERIOD: JUNE 1, 1987 - JULY 31, 1988

BOARD MEETING DATE: SEPTEMBER 15 AND 16, 1988

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) is an integrated U.S. Nuclear Regulatory Commission (NRC) staff effort to collect observations and data on a periodic basis and to evaluate licensee performance on the basis of this information. The SALP process 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 improve the quality and safety of plant operations.

An NRC SALP Board, consisting of the staff members listed below, met on September 15 and 16, 1988, to review the collection of performance observations and data to assess the licensee's performance at the Peach Bottom Station. This assessment was conducted in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The criteria and guidance for this assessment are provided in Section III of this report.

This report is the SALP Board's assessment of the licensee's safety performance at the Peach Bottom Station for the period June 1, 1987, through July 31, 1988. The summary findings and totals reflect a 14-month assessment period.

The SALP Board for the Peach Bottom Station assessment consisted of the following individuals:

Chairman

W. F. Kane, Director, Division of Reactor Projects (DRP)

Members

S. Collins, Deputy Director, DRP
S. Ebneter, Director, Division of Radiation Safety and Safeguards (DRSS)
E. Wenzinger, Chief, Projects Branch No. 2, DRP
R. Gallo, Chief, Operations Branch, Division of Reactor Safety (DRS)
J. Linville, Chief, Projects Section 2A, DRP
R. Martin, Project Manager, Office of Nuclear Reactor Regulation (NRR)
T. Johnson, Senior Resident Inspector, Peach Bottom Atomic Power Station (PBAPS)
B. Boger, Assistant Director, Region I, Reactors, NRR
T. Martin, Director, DRS

Others

J. Strosnider, Chief Materials and Processes Section, DRS
E. Fox, Senior Emergency Preparedness Specialist, DRSS
M. Shanbaky, Chief, Facilities Radiation Protection Section, DRSS
W. Pasciak, Chief, Effluents Radiation Protection Section, DRSS
R. Keimig, Chief, Safeguards Section, DRSS
R. Urban, Resident Inspector
L. Myers, Resident Inspector
J. Williams, Project Engineer
J. Gadzala, Reactor Engineer

II. SUMMARY OF RESULTS

A. Overview

On March 31, 1987, the NRC issued an order to Philadelphia Electric Company (PECo, the licensee) to shut down Peach Bottom Units 2 and 3 as a result of the previous SALP assessment and other pertinent information. Thus, at the beginning of this assessment, both units were in a cold shutdown condition.

The initial licensee response to the shutdown order did not acknowledge the depth and breadth of the problems within the licensee organization. After considerable prodding by the NRC and other outside organizations, the licensee provided a comprehensive response (April 8, 1988). This response included a reorganization to focus the attention of senior corporate management on the nuclear facilities and to strengthen oversight organizations, provided new managers and executives with demonstrated leadership skills at every level from the shift managers to the Chief Executive Officer, increased the number of licensed operators, and worked to develop an attitude dedicated to excellence in nuclear operations with management systems and independent oversight provided to ensure success. It appears that the licensee has made considerable progress toward achieving these goals by focusing attention on the areas of operations, maintenance/surveillance, and engineering/technical support.

Progress has been slower in other areas such as security in particular. Although the licensee had been made aware of a problem in the area of security and safeguards before the end of the assessment period, performance continued to degrade throughout the period with inadequate oversight of the contractor organization.

The performance ratings during the previous assessment period (February 1, 1986-May 31, 1987) and this assessment period (June 1, 1987-July 31, 1988) according to functional area and trend, if any, are given below.

Functional Area	Rating Last Period	Rating This Period	Trend
Plant Operations	*	2	
Radiological Controls	2	2	
Maintenance/Surveillance	2	2	Improving
Emergency Preparedness	2	2	
Security and Safeguards	2	3	
Engineering/Technical Support	2	1	
Safety Assessment/ Quality Verification	+	2	
Training and Qualification Effectiveness	**	***	
Licensing Activities	2	+	
Assurance of Quality	*	+	

* Performance was determined to be unacceptable as reflected in the issuance of the shutdown order (March 31, 1987); therefore, no SALP rating was appropriate.

** Not evaluated as a separate functional area last period because the extent to which apparent weaknesses in supervisor training contributed to the inattentive control room behavior leading to the shutdown order was still under review at the close of the assessment period; no rating was assigned.

*** This functional area has become part of the evaluation criteria for all functional areas and is no longer a separate functional area (see Section III).

\+ Safety Assessment/Quality Verification is a new functional area which combines the previous areas of Licensing Activities and Assurance of Quality.

As mentioned above, this assessment includes the evaluation of Safety Assessment/Quality Verification as a new functional area. The topics assessed in this new area include what was formerly covered under the functional areas of Licensing Activities and Assurance of Quality. Refueling and outage activities were evaluated as part of the Engineering/Technical Support functional area for the first time during this assessment period. Fire protection is assessed in the functional

area of Plant Operations since there was no special programmatic inspection in this area. Housekeeping is included in the area of Maintenance/Surveillance.

B. Other Areas of Interest

1. Licensee Activities

Peach Bottom Units 2 and 3 were issued operating licenses on October 25, 1973 (DPR-44), and July 2, 1974 (DPR-56), respectively. Unit 2 began commercial operation during July 1974 and Unit 3 began commercial operation during December 1974. Units 2 and 3 are boiling water reactor (BWR) systems supplied by the General Electric Company. The status of these two units at the time of this assessment (June 1, 1987-July 31, 1988) is given below, as well as the management changes that resulted from the NRC shutdown order.

Unit 2 was defueled in the middle of a refueling outage at the beginning of the assessment period and remained in a cold shutdown condition, as required by NRC order, during the entire assessment. Core reload, which began June 22, was completed on July 1; core verification was completed on July 28, and the vessel head was tensioned on July 31, 1987. For the remainder of 1987, refueling outage recovery efforts and reactor vessel hydrostatic testing preparations were in progress. The mode switch was placed in refuel and a hydrostatic test was performed from February 21 through March 1, 1988. On May 18, 1988, the reactor vessel was disassembled to conduct an inspection of the reactor vessel shroud access manways. After completion of these inspections, the vessel was reassembled. For the remainder of the assessment period, system maintenance outages, plant modifications, corrective and preventive maintenance, and system testing were performed.

Unit 3 also began the assessment period in a cold shutdown condition. Preparations for the recirculation pipe replacement outage began during August 1987. The pipe replacement outage began on October 1, 1987, and by the end of the year core offload was complete and pipe decontamination activities were under way. Pipe decontamination efforts were completed in January 1988, and the first cut of recirculation pipe occurred on January 26, 1988. By mid-March 1988, all recirculation and residual heat removal (RHR) piping had been removed. Replacement piping installation was complete in early July 1988, and reactor vessel fill began on July 5, 1988. The reactor vessel fill was complete on July 9, 1988, and for the remainder of the assessment period, routine outage work continued.

The shutdown order of March 31, 1987, had instructed the licensee to provide for NRC approval a detailed and comprehensive plan and schedule to ensure that the facility would be operated safely before the NRC would consider a proposal for restart. The

licensee submitted its "Commitment to Excellence Action Plan" on August 7, 1987 for NRC approval. On October 8, 1987, after a detailed review, the NRC informed PECo that the staff had identified several concerns with the licensee's response to the root cause issue and that further review of the plan had been deferred pending receipt of a revised plan that addressed the expressed concern.

In the fall of 1987, the licensee undertook a major reorganization of its site and corporate staff. On October 23, 1987, a new individual assumed duties of Superintendent-Operations. The Peach Bottom shift managers assumed shift leadership roles on October 25, 1987. In October 1987, PECo announced a planned corporate and site reorganization plan including a new Peach Bottom Plant Manager. However, subsequent changes occurred and J. F. Franz, formerly the Limerick Plant Manager, assumed Plant Manager duties for Peach Bottom on January 4, 1988. The licensee also implemented the Nuclear reorganization on January 4, 1988.

The licensee's new "Plan for Restart of Peach Bottom Atomic Power Station" was submitted in two sections: Section I, Corporate Action, on November 25, 1987, and Section II, Station Action, on February 12, 1988.

The licensee also made the following additional corporate personnel changes in March 1988: J. F. Paquette as President and Chief Operating Officer (eventually Chairman and Chief Executive Officer), C. A. McNeill as Executive Vice President - Nuclear, and D. M. Smith as Vice President-Peach Bottom Atomic Power Station. Following staff questions and changes in management a revision to the plan was submitted April 8, 1988.

2. Inspection Activities

Three NRC resident inspectors were assigned to the site during the assessment period. The total NRC inspection time expended during the 14-month assessment period was 7393 hours or 6337 hours on an annualized basis. Distribution of these hours by functional area and a summary of enforcement activities are shown in Tables 1 and 2, respectively, in Section V of this assessment.

Although both Peach Bottom units remained shut down by the NRC order of March 31, 1987, during this assessment period NRC inspection teams evaluated the following areas during the times specified in parentheses.

- environmental qualification programs (June 1987)
- emergency preparedness exercise (December 8, 1987)
- inservice testing program (November 1987)

- shift crew teamwork on the Limerick simulator (November 1987 to January 1988)

- licensed operator rehabilitation training (September 1987 to January 1988)

- Unit 3 pipe replacement nondestructive examination (May 1988)

- Peach Bottom maintenance program (July 1988)

3. Other NRC Activities

The NRC instituted a Peach Bottom Restart Panel to review the licensee's restart plan. Activities include periodic meetings with licensee personnel, development of a restart safety evaluation, and augmented monitoring of licensee activities and performance. The first meeting was held on August 13, 1987.

NRC senior management visits to Peach Bottom during the period include the following:

-- NRC Commissioner K. Carr on December 15, 1987

-- J. M. Taylor, Deputy Executive Director for Regional Operations; W. T. Russell, Regional Administrator, Region I; and S. Varga, Director, Division of Reactor Projects - I-II, on August 11, 1987

-- T. E. Murley, Director, Office of Nuclear Reactor Regulation, and members of his staff on June 27, 1988.

III. CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction or operational phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations in that area. Special areas may be added to highlight significant observations.

The following evaluation criteria were used, as applicable, to assess each functional area:

- assurance of quality, including management involvement and control

- approach to the resolution of technical issues from a safety standpoint

- responsiveness to NRC initiatives

- enforcement history

- operational and construction events, including response to, analyses

of, reporting of, and corrective actions for

- staffing, including management
- effectiveness of training and qualification program

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

On the basis of the SALP Board assessment, each functional area evaluated is rated according to three performance categories. The definitions of these performance categories are given below.

Category 1. Licensee management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.

Category 2. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities is good. The licensee has attained a level of performance above that needed to meet regulatory requirements. Licensee resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.

Category 3. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The licensee's performance does not significantly exceed that needed to meet minimal regulatory requirements. Licensee resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

The SALP report may include an appraisal of the performance trend in a functional area for use as a predictive indicator if near-term performance is of interest. Licensee performance during the last quarter of the assessment period should be examined to determine whether a trend exists. Normally, this performance trend only should be used if both a definite trend is discernible and continuation of the trend may result in a change in performance rating. The performance trend is intended to predict licensee performance during the first few months of the next assessment period and should be helpful in allocating NRC resources.

Determination of the performance trend should be made selectively and should be reserved for those instances when it is necessary to focus NRC and licensee attention on an area with a declining performance trend, or to acknowledge an improving trend in licensee performance.

The trend, if used, is defined below.

Improving. Licensee performance was determined to be improving near the

close of the assessment period.

Declining. Licensee performance was determined to be declining near the close of the assessment period and the licensee had not taken meaningful steps to address this pattern.

IV. PERFORMANCE ANALYSIS

A. Plant Operations (2355 hours - 32 percent)

1. Analysis

During the previous assessment period, the licensee's performance in this area of plant operations was rated as unacceptable as reflected by the shutdown order issued March 31, 1987. Control room operators were found to be inattentive to licensed duties. Shift management knew of and condoned this behavior. Plant management either knew or should have known and took either no action or inadequate action to correct the situation. Corporate management failed to recognize this declining trend in Peach Bottom performance.

During the current assessment period, resident and specialist inspectors routinely reviewed plant operations during shutdown and refueling mode conditions. The functional area of plant operations also was reviewed during operational simulator evaluations, operator rehabilitation training, the maintenance team inspection, and periodic licensed operator examinations.

In response to the shutdown order, the licensee made personnel changes in the operations line organization. A new Operations Engineer, Superintendent-Operations, and Plant Manager were assigned. Later in the period, the Plant Manager was designated the Site Vice President and the Limerick Plant Manager was assigned to Peach Bottom as Plant Manager. Management oversight of operations activities has improved. Management has been involved in daily operations meetings, in immediate followup of events, in providing oversight at event critique meetings, and in interface activities with other plant and site groups.

The licensee implemented a shift manager concept in October 1987 as corrective action in response to the shutdown order. The licensee replaced the shift superintendents with individuals having more authority and a broader responsibility during normal operations. The shift managers each hold a degree in engineering and are senior reactor operators. The licensee activated the licenses for these shift managers and provided them with training, including the "Managing for Excellence" course. The selection process for this new position included an assessment of their managerial aptitude and of the attitudinal readiness to establish and maintain standards of excellence in nuclear operations. Overall, the selection criteria used for these positions were found to be very high, contributing positively to the potential success of the shift manager position and subsequently the success of the new operating crews headed by the shift managers. On the basis of the inspectors' observations, simulator evaluations, and interviews, the shift managers have provided effective oversight of shift operations. They have demonstrated good overall ability to command and control and provide

effective leadership. The effective oversight of these shift managers was evident during the Unit 2 hydrostatic test, response to shutdown plant transients, conduct of shift turnover and other periodic meetings, and functioning as the emergency director during drills.

Licensed operators attended a 6-week rehabilitation training program called "People - The Foundation of Excellence" (PFE). The NRC reviewed course materials, attended portions of the course, and interviewed licensed operators before and after course completion. Specific weaknesses that were noted early in the evaluation process were discussed with site management, and licensee management took action to correct these course shortcomings. Although the NRC concluded that this program was effective, it further recognized that the program would require plant management reinforcement to ensure continued positive effects.

The NRC decided to assess the overall crew interaction, the knowledge and use of Peach Bottom procedures, the knowledge and use of Technical Specifications, crew communications, and operator responsibility because the shift managers and operating crews were newly established. The objective of this assessment, which was performed at the Limerick simulator, was to evaluate the effectiveness of the shift managers and to ensure that all operating crews exhibited acceptable performance for the safe restart of Peach Bottom. Overall, the NRC concluded that each operating crew exhibited satisfactory performance for all areas assessed. The crews responded very well to transients and demonstrated good knowledge and use of Technical Specifications and procedures. The shift managers were effective in their roles as crew supervisors and leaders. Because the Limerick Simulator provided limited opportunity to evaluate the technical proficiency of the licensed operators after an extended shutdown, subsequent evaluations were performed at the new Peach Bottom simulator after the end of the period.

At the end of this assessment period, the licensee had 18 senior reactor operators (SROs) and 18 reactor operators (ROs) with active licenses on a six-shift forward rotation, as well as 7 ROs that had recently passed an examination. Thus, there were 43 licensed shift operators at the end of this assessment compared with 36 at the end of the last assessment. The licensee had not clearly defined to the NRC staff its utimate goal for licenses to assure that unplanned overtime is effectively controlled and that opportunities for short and long term rotation of licensed operators off shift are provided.

During this assessment period, three sets of operator and senior operator license examinations were given at the facility. A total of 5 SRO and 16 RO candidates were examined with 5 RO candidates failing the written and/or operating portion of the examination. This is an overall pass rate of 76 percent and is a decline from the overall pass rate of 93 percent achieved during the last assessment period. After entering emergency

procedures, some candidates were hesitant to use the procedures to respond to the plant conditions in a real-time manner.

Generic strengths found during the examination included the ability to locate reference material in the control room, including piping and instrumentation diagrams, and the acquired knowledge of off-normal and operational transient procedures and administrative procedures.

The licensee was generally conservative with regard to using the emergency notification system (ENS) to immediately report to the NRC. LERs generally were of good quality and precise; however, some reports had poor event descriptions, some lacked information reflective of an adequate assessment, and a large number were late. The cause of these late and poor-quality reports was a communication problem between plant and offsite organizations and an apparent lack of overall report accountability. Specific deficiencies are described in Section V.D. of this report.

A large number of shutdown cooling isolations occurred early in the assessment period. Although each event was reported and the root cause was analyzed, the licensee did not perform an overall root cause analysis and develop a corrective action plan until requested to do so by the NRC. Once requested, this root cause analysis was adequately performed. Some corrective actions have been taken and others are under further study. A reduction in the number of shutdown cooling isolations was seen in the latter part of the assessment period.

A significant improvement has been noted in the quality and implementation of operations procedures. This can be largely attributed to licensed operator awareness of the importance of procedures and compliance with them as taught during the PFE training course. In addition, many licensed operators have initiated procedural improvements. As a result, there were a reduced number of reportable events caused by licensed operator failures to follow procedures. Nonetheless, continued management attention is required to ensure completion of procedural revisions, and adherence to and compliance with procedures at all levels.

Weaknesses were noted in the licensee's permit and blocking (equipment control and tagout) system. Errors both in permit preparation and application resulted in eight reportable events. In addition, the process of temporary clearance of a permit has resulted in reportable events and, in one instance, in damaged valves in the shutdown cooling system, including damage to the Limitorque operators and breakers for these valves.

The licensee was still not ensuring that the required periodic training was being completed by all fire brigade members. Fire brigade training has been identified as a weak area since 1983 in NRC inspections and the licensee's own audits. Corporate management had previously committed to the NRC to improve the

fire protection program to make up for deficiencies in safe shutdown component fire protection and training for the fire brigade. Further licensee attention is needed in this area.

Operations control of plant conditions during outages for both units was a strength. Operations personnel developed and implemented special procedures (SPs) to control these changing plant conditions. These SPs included the coordination and control of reactor water level during the Unit 3 pipe replacement outage, control of special maintenance conditions for both units, control of the Unit 2 hydrostatic test, coordination and conduct of the Unit 3 chemical decontamination, and planned removal from service of the shutdown cooling system for maintenance.

Improvements were noted in overall control room formality and physical appearance. During the shutdown, the licensee completed extensive control room human factor enhancement modifications. Operator demeanor and physical appearance was improved and a new code of "control room etiquette" was developed and implemented. There was a noted improvement in shift turnover, licensed operator attitudes, and overall inter-faces with other departments. No inattentiveness was noted.

The control of overtime meets NRC requirements. Non-licensed operator shift turnover is now conducted outside the control room to minimize overall congestion. The licensee also is currently upgrading the control room office and other facilities. All of these physical, procedural, and attitudinal changes have resulted in an improved control room atmosphere.

In summary, the establishment of the shift manager positions and personnel changes in operations line management appear to be improvements but have not yet been tested in an operating environment. Training conducted to "rehabilitate" the operators was effective, but continued management reenforcement is required to ensure future success. The number of available licensed shift operators increased. Failure to submit timely and complete LERs in some cases, failure to complete all required fire brigade training, and events caused by equipment control deficiencies were considered weaknesses.

2. Performance Rating

This area was rated Category 2.

3. Board Recommendation

- The licensee should ensure that there is continued plant management reinforcement of the operators with the principles of the PSE program.

- The licensee should clearly define and implement a staffing plan for increasing licensed operators.

- The licensee should fully implement fire brigade training.

- The NRC should conduct additional licensed operator proficiency and shift crew performance evaluations at the Peach Bottom Simulator.

B. Radiological Controls (591 hours - 8 percent)

1. Analysis

The previous performance rating in this area was Category 2. The licensee had an effective environmental monitoring program and innovative chemistry control. Weaknesses in the radiation protection program had been observed as a result of understaffing of supervisors, poor followup on deficiencies, weak upper management leadership, poor policies and procedures, ineffective internal assessments, and hostile relations between departments.

During this period there were five radiation protection inspections, one radioactive waste management inspection, one non-radiological chemistry inspection, and a special maintenance team inspection. A management meeting was held in February 1988 to discuss radiological protection program concerns.

Radiation Protection

Most weaknesses in the previous assessment were resolved during this period. The health physics (HP) organization in the HP operations area was significantly expanded and restructured. Six new shift foremen were added, reporting to the operations supervisor. This action increased oversight of activities in the plant on all shifts and weekends. A new operational HP supervisor was hired into the organization and has introduced new approaches and expertise to this area. Job descriptions with clearly defined accountabilities are now available for these positions. These positive developments were affected somewhat by the extensive outage work, the reorganization, and two changes of upper department management.

Several positions remained unfilled for an extended time, contributing to delays in the development and implementation of new policies and procedures that were completely rewritten during this period. Although the procedures are now clear and consistent, the busy outage schedule caused some problems with implementation such as numerous failures to adequately survey. Nonetheless, the licensee resolved these difficulties with increased training on the procedures for all personnel.

Internal assessment was improved during this period. A cumbersome radiological deficiency reporting procedure was replaced with a procedure that focused more attention on performance improvement and root cause analysis. The licensee formed a corporate HP assessment group that completed several onsite reviews. Quality Assurance (QA) auditing became more effective as a result of changed QA procedures, training of QA personnel, and use of outside technical experts. For example, a QA audit

finding led to the development of more job-specific radiation work-permit requirements. In addition, the Nuclear Review Board became actively involved in efforts to reduce incidents of skin and clothing contamination. Toward the end of this period, the licensee began sending its personnel to visit other sites so that they could benefit from the experiences at other nuclear utilities.

Relations between HP and other site departments such as operations and maintenance were dramatically improved toward the end of the period. Frequent and cooperative interfacing at worker and supervisor levels was observed. Corporate and plant management efforts to achieve a team approach to resolve problems on the site were a major accomplishment this period.

The licensee has not effectively used aggressive goals to improve ALARA performance. The station goal for 1988 was set at 3610 person-rem and the initial goal for recirculation pipe replacement (RPR) was selected as 1725 person-rem. Additional programmatic weaknesses included failure to pursue worker suggestions, an ineffective station ALARA committee, and minimal effort to create a positive worker attitude toward ALARA. The new plant manager initiated action to resolve these weaknesses toward the end of the assessment period. This included improving supervisory attendance at the ALARA committee meetings and a clear demonstration of management commitment to ALARA. A periodic ALARA newsletter, a poster campaign, and ALARA awards demonstrate this commitment. The RPR project was nearing completion with exposures much lower than anticipated at less than 1300 person-rem. This excellent performance is attributed to a highly experienced contractor force and excellent oversight by the licensee. No major radiological problems were experienced during this project and the contractor ALARA program displayed initiative and creativity.

The inservice training of HP technicians was weak as a result of inexperienced instructors and poor facilities. Although a major restructuring of the training department has occurred, its effectiveness has yet to be observed.

The licensee's approach to certain technical issues was sound; however, delays were sometimes noted. A new "total dose control" program was implemented. All personnel are now required to pass through a general access control before entering the power block and log in on a radiation work permit so that dose can be tracked. In addition, good control of hot particles as well as improvements in locked high-radiation areas was observed. The licensee also decontaminated a large portion of the plant and eliminated a number of hot spots, which has resulted in more accessible plant areas and a better worker attitude. This improvement was the result of the licensee using highly qualified technical consultants as part of its commitment to excellence program.

Radioactive Waste Management and Transportation

During this assessment period one inspection of the licensee's solid radioactive waste (radwaste) program was performed, including processing, preparation, packaging, and shipping. The radwaste organization was recently reorganized and has responsibilities for waste processing, classification, inventory minimization, planning and engineering activities, and radwaste packaging and shipping. Through this reorganization, the licensee strengthened and clarified the responsibilities of the group. Approximately 75 percent of the current staff was supplied by contractors. Procedures were revised, updated, and developed to support solid radwaste and shipping activities. The licensee conducted a campaign to characterize, prepare for shipment, and dispose of accumulated solid radwaste (some of which had been on site since 1983). As a result, the licensee made an average of 22 radioactive materials shipments per month during the period of October 25, 1986, to February 12, 1988, effectively eliminating the onsite backlog. Implementation of the QA/QC program was adequate based on a review of audits.

Chemistry Control

The licensee's capability to monitor chemical parameters in various plant systems with respect to Technical Specifications and other regulatory requirements was reviewed. The chemistry program is administered by the senior chemist, who now reports to the Superintendent-Plant Services, as a result of a reorganization. Before the recent reorganization, the chemistry group was under the direction of Operations. Development of the database management system as part of QA/QC was excellent. The licensee has a good training program in the chemistry area. The results of the standard measurements comparison indicated an excellent level of agreement.

In summary, improvements were noted during this period in the areas of staffing levels, internal assessments, and interdepartmental working relationships. However, the ongoing major outage work and major reorganization affected progress. Resolution of technical issues is sound but sometimes delayed. Improvement in radioactive waste management was noted. The chemistry program continues to be excellent. A weakness persists regarding ALARA goal setting, and the effectiveness of recent changes in the training program for radiological controls will need to be determined.

2. Performance Rating

This area was rated Category 2.

3. Board Recommendation

None

C. Maintenance/Surveillance (2413 hours - 33 percent)

1. Analysis

The previous performance rating for maintenance was Category 2 with no significant weaknesses noted; the rating for surveillance also was Category 2. During that assessment period, equipment was maintained by an adequate staff and procedures. Maintenance problems were well documented and licensee responses to NRC-identified weaknesses were adequate. Surveillance testing was successful in uncovering equipment problems during testing, and procedures, test conduct, and results review were good. Plant and line management oversight and control increased the assurance of timely test performance.

During this period, overall maintenance and surveillance activities were reviewed during routine NRC inspections. In addition, detailed inspections of maintenance and surveillance activities were conducted by two NRC teams. One team examined the Inservice Testing (IST) program and the other team conducted a performance-based pilot inspection of the maintenance process.

As part of the PECo nuclear reorganization, Maintenance and Instrumentation and Controls (I&C) Departments were combined into one section reporting to the Plant Manager. Staffing of the Maintenance/I&C Section with supervisory, engineering support, craft, and technical personnel is adequate. However, numerous vacancies within the section were noted, mainly in the entry-level craft and I&C positions.

The nuclear reorganization, the upgrade of vendor technical manuals, and past procedural problems, have all been addressed by rewriting maintenance and I&C procedures. The I&C vendor technical manuals are now under the control of a central documentation system, which is intended to correct the past problem of using out-of-date vendor manuals while performing maintenance on I&C equipment. Guidance available for the preparation of maintenance procedures is adequate. Control and distribution of procedures and drawings are well defined and implemented. However, a weakness was identified concerning the continuation of a 5-year review cycle for maintenance procedures. A 2-year cycle is currently the industry standard.

The training, testing, and qualification program for maintenance and I&C personnel is currently INPO accredited. The program appeared well documented and established. General, specific, safety-related, and special training is provided to the work force. Formal continuing training is established for the I&C work force, but is not formalized for the maintenance craft work force. However the training for the I&C work force does not include training for repairs on specific sophisticated radiation protection equipment. Rigorous testing and qualification are

evident throughout the training process and are apparent during work activities.

The Barbadoes Training Facility is a retired fossil plant that is being used for maintenance craft training. Numerous mock-ups are in place and being used for generic component training purposes. However, specific training on the maintenance, overhaul, and rebuilding of the emergency diesel generators (EDG) was not evident. Only two craftsmen had the special 2-week hands-on EDG course conducted by Colt, Fairbanks, Morse. Therefore, while the EDGs were being overhauled, two vendor representatives were required on site for guidance, and contractor personnel were needed on the work crew. More craft personnel are scheduled to attend the EDG course, and the licensee is investigating the purchase of an EDG for the Barbadoes Training Facility.

Licensee corporate and plant management involvement in the maintenance process was exemplified during an onsite monthly meeting, which includes discussing maintenance performance indicators and trending efforts described in the Station Review Report. Plant management has committed to ensuring that maintenance issues are being addressed. A recent program was established to ensure that industry-wide concerns reported by NRC, INPO, and other utilities have been properly addressed. Previously, some of these concerns, which were applicable to Peach Bottom, were not addressed. Management involvement to ensure quality also was evidenced by an innovative "predictive maintenance" program overseen by the Maintenance/I&C Section. The program utilizes computerized analysis to track and predict component failures in safety-related and other systems. Included in the analyses are oil sampling, acoustic vibrations, and thermography.

In the past, preventive maintenance (PM) and corrective maintenance (CM) were deferred without proper review. As a direct result, a large backlog of maintenance work items was generated. During the assessment period, over 16,000 additional work items were written for both units. A major effort was undertaken by the licensee to reduce the backlog to a manageable level. In addition, the licensee performed a review to identify and schedule all deferred work. By the end of the assessment period, the number of remaining open work items was approximately 2600 for Unit 2 and 7300 for Unit 3. To prevent recurrence of this large backlog, the licensee initiated a program in which deferred work must be reviewed and approved by the Engineer-Maintenance for preventive maintenance and by the Superintendent of Operations for corrective maintenance. This program is formalized by a procedure for preventive maintenance and is controlled less formally by a memorandum for corrective maintenance. The licensee plans to complete all preventive maintenance before restart. Post-maintenance testing of work performed is acceptable, but needs to be proceduralized.

The licensee has implemented improvements in overall plant housekeeping and material control. The numb. of contaminated areas has been reduced. Plant component labeling and painting also have improved the overall plant appearance. However, the licensee noted a declining trend in plant housekeeping toward the end of the period.

During the assessment period, maintenance and I&C workers were knowledgeable, performed work well, and showed a strong sense of pride regarding the quality of their work. First-line supervisors were routinely on the job site. Conflicts between craft and radiation protection personnel were reduced since the last assessment period.

Numerous reportable events occurred during maintenance and surveillance activities. Poor work practices inside control cabinets resulted in several of these events. Reportable conditions included blocking and temporary clearance of blocking permits during maintenance as decribed in Section V.D. of this report.

QA audits of significant maintenance activities were complete and QA findings were given appropriate management attention. By design of the maintenance request form system, quality control (QC) is an integral part of maintenance activities. In the past, the quality trending reporting system identified problems within the maintenance and surveillance area, but did not assign responsibilities or closing dates for those identified problems. The new trending reporting system has corrected this deficiency. In addition, QA personnel escalate overdue assignments to plant management for action.

Surveillance test (ST) performance, use of procedures, shift oversight and test control, and test results reviews were well done. Resolution of technical issues was evidenced by the licensee's discovery of plugged emergency service water (ESW) piping to various emergency core cooling system components during a special surveillance test. As a result, ESW piping will be replaced before restart of Units 2 and 3. Surveillance records, including test results and documentation, were easily recovered and readable.

A problem was noted with the method of tracking partially completed STs. The licensee's ST software program (STARS) cannot completely differentiate between partially completed STs and fully completed STs. Manual tracking of partially completed STs was necessary to ensure completion. Although manual tracking appeared adequate, a violation was noted during the assessment period in which a partially completed ST was never completed. The licensee has been responsive to this problem and has committed to upgrade its STARS program to correct the deficiency.

Several problems were noted with the licensee's inservice testing (IST) program. Interpretations of ASME Code Section XI requirements by the licensee were vague, incorrect, or inconsistent with the NRC staff positions. For example, test procedure acceptance criteria for high-pressure service water pumps allowed greater deviations in pressure and flow than allowed by the Code. In addition, improvements were needed to upgrade IST surveillance procedures when followup actions were necessary to resolve previously unacceptable component data. Clarity of acceptance criteria also needs to be improved in IST surveillance procedures. Finally, the ability to recall test schedule adherence on a component basis needs improvement because ASME Code requirements for IST are integrated into a system-oriented surveillance program. The tracking system does not cross-reference by component, which could lead to a missed component test.

QA audits on IST of pumps and valves were minimal and lacked technical depth. QA/QC involvement in general surveillance testing was good. QC personnel use detailed monitoring checklists to ensure that STs are performed when scheduled. QC also performs independent verification reviews of instrument STs. QA audits are timely and recommendations are communicated to management.

In summary, performance in the maintenance/surveillance area was effective. The reorganized Maintenance/I&C Section, along with rewritten maintenance, I&C, and surveillance procedures should further strengthen performance in this area. The training, testing, and qualification of personnel were good. Corporate and plant management involvement in the maintenance area was ample. Aggressive action in reducing and maintaining a low work item backlog will be necessary. QA/QC oversight of maintenance and surveillance was effective. Improvements are needed in the interpretation of IST ASME Code requirements, IST surveillance procedures, IST test schedule, and QA audits of IST activities.

2. Performance Rating

This area was rated Category 2 and showed an improving trend.

3. Board Recommendation

The licensee should adopt a program that will assure that the maintenance backlog is maintained at a manageable level.

D. Engineering/Technical Support (1145 hours - 15 percent)

1. Analysis

The previous performance rating in this area was Category 2, and it was noted that licensee management was strongly oriented toward engineering and technical support. In addition, the licensee had integrated effective engineering support within

each company discipline. Notable weaknesses that were not given attention were the oversight of the fire protection and site electrical load growth areas.

The system engineer concept and its implementation continues to be a licensee strength. The system engineers were involved in daily operational assessments of the plant systems they were responsible for. This includes system performance monitoring, system walkdowns, problem identification, maintenance followup, and post-maintenance testing. These system engineers demonstrated a good working interface with operations, maintenance, outage support, and corporate engineering personnel. Examples of this included identification of a configuration error in the control room radiation monitoring system, the planning and conduct of the Unit 2 hydrostatic test in February 1988, and the Unit 2 system maintenance outages and modification acceptance testing during 1988.

During this assessment period, refueling floor activities, such as vessel assembly and disassembly, core off-load and reload, and in-vessel inspections, were successful through the efforts of plant personnel as assisted by various engineering support groups. This assistance included support from the reactor engineering systems engineers, inservice inspection engineers, onsite maintenance engineers, and vendor (GE) engineering groups.

Engineering support for the modification process resulted in the successful completion of a large number of plant modifications on both units. The corporate Nuclear Engineering Department performed adequate safety evaluations for these plant modifications and the planning, procurement, and installation of modifications were effective.

Although the modification process was effective, weaknesses were identified in the plant configuration control system. These weaknesses included the adequacy of the current design, modification implementation, and design versus as-built hardware. Weaknesses identified by both the NRC and the licensee included logic discrepancies in the diesel generator Cardox and core spray test loop, deficiencies in the control room panel seismic installation, and implementation of a modification that could have resulted in a loss-of-feedwater-heater event outside the design basis. Licensee corrective actions were aggressive and included the development of a configuration control management program by a steering committee and implementation through existing engineering and QA organizations.

In the previous assessment period, Appendix R (Fire Protection) deficiencies resulted in escalated enforcement. The licensee increased corporate and engineering management attention to the Appendix R issues and also committed additional resources. These resources included forming an Appendix R task force and

the use of specialized consultants. This increased effort and attention by management contributed to an improved Appendix R program that is maintainable and easily understood. The procedures that were developed are adequate, and the hardware is sufficient to perform the tasks involved.

Corporate technical and engineering support of the Unit 3 pipe replacement outage was effective. The planning and implementation of the pipe chemical decontamination resulted in a higher than expected decontamination factor and a lower overall dose for the pipe replacement outage. A well-staffed site engineering and project management organization for the pipe replacement project demonstrated effective planning and implementation that resulted in the successful completion of the pipe replacement.

The licensee used experienced contract personnel during the pipe replacement and ongoing work activities during this assessment period. The licensee's management demonstrated good control over the contractor activities. Licensee engineering and QA personnel involvement included required review of procedures, instructions, and radiographs and an extensive QA audit and surveillance program. The licensee's identification of unacceptable radiographic indications and missing radiographs during review of a subcontractor's work is a good example of the thoroughness of the licensee's efforts. The licensee established good management controls for the preservice inspection (PSI) of recirculation replacement piping. The licensee's PSI program exceeded applicable ASME Code and NRC requirements by using a computerized ultrasonic testing system that records a comprehensive baseline signal for reference in evaluating future PSI results.

Management involvement in ensuring quality was evidenced by the significant commitments the licensee made in staff and resources to improve ESW piping systems for both units. However, during an NRC review of ongoing work in this area, a problem was noted with regard to construction division procedures. Pipe spools for ESW were fabricated using sketches that were not part of the drawing control system and showed no evidence of approval prior to release. In response to this problem, the licensee indicated that it was of minor significance because subsequent QC inspections would identify deviations from the original design. Although this is an isolated incident it indicates a lack of control of work process and insensitivity of corporate management to the significance of the issue.

In the environmental qualification (EQ) area, management involvement and responsiveness to NRC initiatives were adequate. Certain minor specific deficiencies with EQ files were noted; however, the EQ file reviews disclosed that the equipment was qualified. The staffing and qualification in the EQ area also was ample with the assignment of dedicated engineers.

In summary, the licensee continues to provide effective engineering and technical support for site activities. Strong support of the Unit 3 pipe replacement outage was evidenced. Other licensee-related strengths included: systems engineer concept, support of the modification process, support of refueling floor activities, and the Mark I containment program.

2. Performance Rating

This area was rated Category 1.

3. Board Recommendation

None.

E. Emergency Preparedness (276 hours - 4 percent)

1. Analysis

The previous performance rating in this area was Category 2. The basis for this rating was satisfactory response capability in the 1986 annual exercise and satisfactory progress in most areas identified in a previous confirmatory action letter.

During the current assessment period, the 1987 partial-participation exercise was observed, four routine safety inspections were conducted, four emergency response drills were observed, and changes to emergency plans and implementing procedures were reviewed.

A partial-participation exercise was conducted on December 8, 1987, during which the licensee demonstrated a satisfactory emergency response capability. The emergency response facility managers demonstrated effective direction and control; the technical support center (TSC) staff provided effective coordination of activities and timely resolutions to most problems; and the emergency operations facility (EOF) staff utilized field teams effectively. No significant deficiencies were identified although several minor weaknesses were noted.

In each observed drill, the licensee demonstrated adequate emergency response capability. The shift managers' use of emergency procedures, event classification, and overall command and control were effective. The most significant weakness identified was slow staffing and activation of the TSC, partly caused by an inefficient callout procedure.

The NRC identified deficiencies in programmatic areas such as audits of the emergency preparedness program, ability to perform corrective actions, and station and corporate emergency preparedness staffing and management. An NRC review of licensee audits in the emergency preparedness area between 1983 and 1985 indicated that audits were not broad enough in scope to meet the requirements of 10 CFR 50.54(t). Although two audits conducted in 1986, which met 10 CFR 50.54(t), identified program discrepancies and recurring deficiencies, they were not properly distributed to management. However, the 1986 audit did conclude that the emergency preparedness program was generally in a state of readiness to respond adequately to an emergency. As a result of these findings, the NRC issued a notice of violation to the licensee for failure to comply with 10 CFR 50.54(t) audit requirements. In 1987, the QA Department performed a comprehensive audit of the emergency preparedness program and identified many deficiencies, however they remained uncorrected at the time of the NRC inspection in February and March 1988.

During the April 1988 inspection, additional deficiencies were identified in the licensee's emergency detection and classification system. The emergency action levels (EALs) were not consistent with NUREG-0654 guidance because components and systems had not been identified, instrument readings were not given, and initiating conditions were not quantified. As a result, the EALs were often vague. The emergency preparedness training program in place was adequate although some weaknesses were identified regarding effectiveness of training of operators in the use of the EALs during walk-through examinations and EP exercise observations.

The causes for these programmatic weaknesses with audits, corrective actions, and EALS were inadequate staffing and a lack of management involvement. Responsibilities were poorly defined and accountability was not evident. It should be noted that although outside of the assessment period, the licensee has approved a policy that delineates the responsibilities for the emergency preparedness program as well as corporate and site interfaces. Additionally, a new emergency preparedness organization has been approved. Onsite activities will be performed by the Site Emergency Preparedness Coordinator (SEPC) who reports through the Support Manager to the Station Vice President. All other program elements will be performed by the corporate staff. Program direction will be provided by the corporate staff. A mechanism is in place to ensure accountability of performance, as well as to ensure proper interface between site and corporate staffs for the resolution of program needs. The licensee has approved a change in the SEPC and is actively looking to install an individual with strong onsite

experience as well as emergency preparedness experience as the new SEPC.

Late in the assessment period, significant changes occurred in the emergency preparedness program. The licensee completely rewrote and restructured its emergency response procedures (ERPs). These ERPs are clearly written, adequately reflect the concepts of emergency management, and clearly define responsibilities. Each ERP has a flow chart that ensures the procedures are properly followed and that also functions as a checklist.

The licensee instituted a new emergency duty system to correct weaknesses that it had identified in staffing and activation. The licensee integrated this system with its normal duty management system. The licensee also instituted a new system to provide for a more timely callout of personnel. The licensee has revised the EALs and they are now consistent with guidance of NUREG-0654. Systems and components have been identified, appropriate initiating conditions have been quantified, and the EALs are now generally clear and unambiguous. Other major changes include the incorporation of a new OSC to support plant emergency operations. Many open items have been closed out and significant progress has been made toward closing those items that are still open.

In summary, the licensee has demonstrated a renewed commitment to effective emergency preparedness. Management involvement is evident at all levels. Corporate policy has been established and organizational and program changes have been effected. The licensee has been responsive to NRC concerns and is continuing to make progress in these areas. Management also has been effective in the latter portion of the period in identifying problems, determining the root cause, and taking appropriate actions. Although there are still program areas that need improvement, particularly in corrective actions, the licensee has identified the elements necessary to achieve effective results.

2. Performance Rating

This area was rated Category 2.

3. Board Recommendation

None.

F. Security and Safeguards (613 hours - 8 percent)

1. Analysis

The previous performance rating was Category 2. That rating was largely based upon the licensee initiating actions to respond to NRC concerns about the security program that were expressed during the previous two SALP periods. In fact, the licensee had

made several significant changes, for example, (a) a reorganization, including the establishment of a Director of Nuclear Security with responsibility for the security programs at the licensee's nuclear plants; (b) assignment of a technical analyst to assist the Director; (c) establishment of eight positions for proprietary security assistants to monitor the security contractor's performance on a shift basis; and (d) the assignment of two technical assistants to the licensee's senior onsite security representative for the Peach Bottom plants. In addition, capital resources were expended to improve security facilities, systems, and equipment.

Five routine unannounced physical security inspections and one regulatory effectiveness review (RER) of the Peach Bottom security program were performed by the NRC during this assessment period. Routine resident inspections continued throughout the assessment period.

During this assessment period, personnel performance-related aspects of the security program declined despite the apparent increase in corporate and plant management attention to the program and to changes that were instituted during the last assessment period. Early in the assessment period, numerous allegations from members of the contract security force were reported to the NRC regarding the program. The majority of these allegations related to insensitivity on the part of the licensee's security contractor to human factors and the resultant effect on the performance capability of the security force. It was alleged, for example, that members of the force were required to work long hours without a break and without rotation of tedious assignments; were forced to work excessive overtime in order to retain their jobs; and were so frequently being recalled for work that it was affecting their personal lives. When the NRC reviewed these allegations, they were found to be generally valid. Further, the NRC found that, in addition to the greater-than-normal security staffing requirements as a result of outage activities and maintenance, and upgrading of security systems and equipment that required posting of guards as compensatory measures, the security force contractor also was under contract by the licensee to provide staffing for firewatches necessitated by outage activities. The available staffing to meet both of these contractual obligations was minimal; therefore, the contractor resorted to the extensive use of overtime, which further exacerbated the problem by increasing terminations because of dissatisfaction with the forced overtime and poor working conditions. Additionally, the span of control for the contractor's security supervisors was increased as a result of the added workload associated with the firewatches, resulting in little time being available to ensure appropriate reliefs and rotations for those on duty.

Either the licensee did not recognize these problems or the problems were not escalated to a sufficiently high level of

management to take appropriate action. In view of the changes initiated in response to NRC expressions of concern during these previous SALP periods, as noted above, neither of these two possibilities should have developed if the licensee was properly exercising its responsibility to oversee the program. The proprietary security shift assistant positions that were established and filled were intended to provide the necessary oversight of the contractor on a shift basis, while the other positions were intended to provide the licensee with an overview of program effectiveness. Since apparently neither expectation was realized, the licensee's selection, training, and supervision of these individuals and its understanding of its responsibility for continuous program oversight to ensure effectiveness were weak.

Even though the NRC's review of aforementioned allegations did not identify any specific violations of NRC requirements, the poor morale and attitude existing among the security force create the potential for regulatory issues to develop, stemming from performance-related problems. That concern was communicated to the licensee early in this assessment period and on several occasions thereafter. In February 1988, allegations of poor personnel performance and program weaknesses were reported directly to the licensee by a member of the security force. At that point, the licensee commissioned an investigation by its corporate Claims/Security Division to review the allegations. That investigation substantiated many of those allegations and provided the licensee with concrete evidence of the extent of the problems. A subsequent audit by the licensee's Nuclear Quality Assurance Division provided additional credibility to the findings of the investigation. On the basis of those findings and further expressions of concern from the NRC during several management meetings, the licensee began to take decisive actions to correct the problems.

Corrective actions were initiated on the specific problems identified in the licensee's investigations and audit. An extensive and comprehensive monitoring program was instituted to determine the performance capability of the entire security force and to assess those areas where new or additional training was required. Actions were initiated to reduce human factors problems. Organizational and personnel changes were made in an attempt to correct the previously fragmented and weak onsite management of the security program. The current security force contractor for the licensee's Limerick Generating Station was awarded the contract for the Peach Bottom plants. Contract language was strengthened, performance incentives were included, and a comprehensive plan was developed by the licensee to ensure a smooth transition and an increased program effectiveness. In addition, the licensee commissioned its Independent Safety Engineering Group, with the assistance of independent consultants, to conduct a root cause analysis of the security program problems. That analysis concluded that there exists: (1) unclear

scope and responsibilities for the program, (2) philosophical differences on what constitutes an appropriate performance level, and (3) a "hands-off" attitude toward the contractor and ineffective management of the security contract. The licensee has developed and is implementing an action plan to address those findings.

An NRC regulatory effectiveness review (RER) was conducted during this assessment period; relatively few problems were found at the Peach Bottom plants. An RER focuses mainly on security concepts, systems, and equipment. The licensee expended considerable capital and human resources in preparation for the RER to repair, update, and improve its security systems and equipment for the security program. On the basis of the results of the RER, it is, therefore, apparent that the licensee possesses, or can obtain, the necessary technical security expertise to perform well when sufficient management interest and attention are focused on the task and management's involvement and commitment are highly visible to all employees, as was the case in preparing for the RER.

In addition to the activities associated with the preparations for the RER, the fitness-for-duty program being implemented by the licensee is another area in which management's involvement and commitment are highly visible. Recent licensee initiatives in the area included assigning a full-time claims/security investigator to the site; purchasing dogs trained to detect drugs for use in unannounced searches at the plants; maintaining an excellent working relationship with local, State, and Federal law enforcement agencies; initiating a revised corporate drug policy to include random drug testing; and immediately reporting and following up on potential illegal substance abuse problems.

A total of 14 security event reports were promptly submitted to the NRC during this assessment period. These reports were clear and generally thorough. However, corrective actions were not always effective as evidenced by repetitive similar events involving performance-related problems on the part of security force members.

In summary, the licensee's performance declined during this assessment period despite the changes made during the last period to improve the program. The decrease is mainly attributed to a lack of effective oversight of the contractor and a lack of aggressive senior management involvement and direction of the program. The result of the ineffective contractor oversight left the licensee with a high potential for performance-related problems in the security force. Midway through the period, the licensee began to recognize the problems, which are largely people- and performance-oriented, and initiated actions to correct them. An RER conducted during the period indicated that the licensee has available the necessary security expertise to implement a security program that is acceptable to the NRC.

A concerted effort must be applied to correct the people- and performance-oriented problems. The licensee also continued its aggressive implementation of an excellent fitness-for-duty program during this period and is commended for its initiatives in that regard. Senior management's involvement in and commitment to that program are highly visible. Similar involvement in and commitment to the security program are necessary before and after the plants are restarted.

2. Performance Rating

This area was rated Category 3.

3. Board Recommendation

The NRC should conduct a special team inspection to evaluate the licensee's self-assessment capability and its implementation of corrective action.

G. Safety Assessment/Quality Verification

1. Analysis

Assurance of quality has been considered a separate functional area in past SALPs, in addition to being one of the evaluation criteria in functional areas. This area has been expanded to encompass activities including safety evaluations, previously evaluated in the functional area of Licensing. This discussion is a synopsis of quality and safety evaluation philosophies reflected in other functional areas. In assessing this area, the SALP Board has considered attributes that are key contributors in ensuring safety and verifying quality. Implementation of management goals, planning of routine activities, worker enthusiasm, management involvement, and training are examples.

During the previous assessment period, licensee performance in the Assurance of Quality area was rated as unacceptable as reflected in the issuance of the shutdown order. The problems noted, which were operator complacency and inadequate procedural compliance, had continued and, in part, led to the shutdown order; however, the central reason for unacceptable performance in this area was that plant management was unable or unwilling to correct known deficiencies in operator conduct that had potentially significant safety consequences.

Corporate management in its initial response to the shutdown order failed to recognize or accept responsibility for the degrading conditions at Peach Bottom. As a result, corrective actions as addressed in the "Commitment to Excellence" action plan were inadequate with regard to corporate oversight of and accountability for site activities. The licensee was responsive to this NRC concern. Subsequent changes in corporate structure

and personnel and proposed changes in corporate attitude have been effective in addressing this root cause.

The licensee restructured the entire operations management organization in response to the shutdown order. As discussed in Section IV.A, improvements were noted both in shift oversight by the new shift manager and in operations and plant management oversight by new personnel. Shift managers have been effective in providing leadership to the shift personnel. The new operations management has been involved in providing effective oversight of daily operating activities; this oversight has included involvement in routine meetings, event followup, and interface activities as noted in Section IV.A.

The licensee has revised the Nuclear Review Board (NRB) charter and procedures, including changes in NRB membership. Three senior consultants have been added to the NRB. NRC inspector attendance at several NRB meetings in the latter part of this period seemed to indicate that these changes are positive. NRB members are more probing in their analysis of problems. For example, the NRB has reviewed in detail the root causes of personnel errors and contamination of personnel skin and clothing. Each new shift manager has had an opportunity to address the NRB without his operations management present.

When a technical problem was identified, the licensee was aggressive and thorough in evaluating potential similar effects on other plant systems or components. Two examples are: (1) When the licensee discovered that piping for the control room ventilation radiation monitor sensing line was installed incorrectly, the Nuclear Engineering Department initiated a program to ensure that all parameters that actuate safety signals are properly sensed and (2) when the licensee noted that a steam plant modification reduced the margin of a transient analyzed in the FSAR (i.e., inadequate safety evaluation), the Independent Safety Engineering Group (ISEG) reviewed the safety evaluations for non-safety-related modifications. On the other hand, licensee review to establish the root causes of multiple shutdown cooling isolations was initially weak and many LERS were late as noted in Section IV.A.

The Plant Operations Review Committee (PORC) has provided effective oversight of plant operations. A change in PORC membership, including a designated PORC Chairman, occurred during this assessment period. Examples of good PORC review and involvement include the review of plant conditions necessary to change operating modes for the Unit 2 hydrostatic test and the development of formal technical specification interpretations through the approval of PORC positions.

The involvement of licensee corporate and plant management in overall station performance is exemplified by a monthly meeting to discuss performance indicators and trending efforts as

described in the monthly station review report. Plant management has committed to ensure that NRC open items and other related issues are being addressed. A recent program was established to ensure that industry-wide concerns reported by NRC and INPO and other concerns are identified and resolved.

Early in the period, senior management support and improvement of the quality verification effort were evidenced by the increased presence of QA and QC personnel at the site, emphasis on the observation of ongoing activities in both auditing and monitoring by the QA and QC organizations, reduction in the backlog of open corrective-action items, and the QC monitoring effort that was consistent with expected completion dates. Additional involvement and support by management were apparent in that licensee efforts related to the restart action plan were progressing in an orderly fashion consistent with established priorities.

Review of the licensee's procurement program identified a problem regarding the suitability of commercial-grade items for safety-related applications. In response to this, the Nuclear QA Department conducted a comprehensive study to determine the type and extent of problems in the procurement process. A corrective action program that detailed specific actions to upgrade the procurement process was developed and provided to senior management. A major recommendation in this area, integration of the procurement process into the plant organization, resulted in the establishment of a site engineering group that reviews all new purchase orders. A procurement study and associated recommendations indicate management involvement in and commitment to the improvement of the procurement process. The study and associated report reflect a positive trend in the performance of the QA Department. The stop-work actions by personnel in the QC section and their continued involvement in corrective actions, including the inspection and testing of suspect items, demonstrate their decisiveness and technical competence.

Involvement and oversight of nuclear engineering management and QA personnel during the Unit 3 pipe replacement outage were effective as evidenced by their comprehensive program, which consists of auditing, surveillance, and documentation review activities. This resulted in the successful completion of a complex project. However, a weakness was noted regarding the involvement of QA and QC personnel in the Unit 2 hydrostatic test in February 1988. Although the QA and QC personnel performed their required programmatic reviews, there was no review of open items that could potentially affect the operability of systems required for the hydrostatic test. The licensee's response in regard to this deficiency was positive once it was pointed out by the NRC inspectors.

The licensee's response to regulatory initiatives including generic letters, unresolved safety issues, information notices,

bulletins, and NRC unresolved and open items was technically adequate. However, early in the assessment period, corporate and site management did not appear to be effective in ensuring that previously identified NRC issues are dealt with in a timely manner. Later in the period, the licensee initiated significant actions to reduce the number of NRC open items. The designation of an individual responsible for coordinating open items and the assignment of accountability for each open item have resulted in a reduction of NRC open items.

In the latter part of the assessment period, the previously separate QA and QC organizations were consolidated to form one QA organization. The transition to the consolidated QA Department was well planned so as to facilitate interdepartmental cooperation and communication. Reassignments were based on specific abilities and experience. Staffing allocations were decided on the basis of past experience, and additional personnel were requested if deemed necessary. The inspectors observed that the new QA Department, as evidenced by its current involvement and performance, is an improvement over the previous organizations.

Oversight of the security force and security program was weak during the period. Numerous safeguards event reports attributable to inattentive guards, allegations of low guard morale, and excessive overtime as well as NRC and licensee assessments of security were indicative of poor performance. The division of responsibilities among corporate, site, and contractor security management was not defined. Licensee root cause analysis and corrective action plans were performed at the end of the assessment period. Toward the end of the period, the licensee announced a new security contractor and replacement of site security management.

Early in the period, weaknesses were noted in oversight and QA involvement in emergency preparedness. Programmatic weaknesses in emergency plan audits, corrective actions, and emergency action levels were caused, in part, by poor corporate oversight and site implementation. Late in the period, the licensee initiated significant actions to remedy these weaknesses in response to NRC concerns.

During the period, licensing activities were subordinated to those activities associated with the shutdown order and the PECo reorganization. Traditional licensing activities were generally limited to license amendment applications already in progress and followup of generic issues. The licensee has been responsive in regard to both the technical adequacy and the timeliness of its responses to these issues, and a number of the issues have been resolved because of this level of response. The licensee's licensing staff appears to be benefiting from a slightly improving trend in the level of resources and to be experiencing relatively little turnover. The licensee's

technical staff appear adequate both in resource levels and experience. The licensing staff is very involved in site activities. Near the end of the period as the licensee's new management assumed its responsibilities, the traditional licensing functions regained much of their vigor. These functions appear to be carried out effectively in a fashion complementary to the licensee's efforts to manage restart activities.

The licensee has been aggressive in the area of fitness for duty. The use, as a deterrent, of dogs trained to detect drugs during unannounced searches, the assignment of a full-time onsite security investigator, recent corporate management policy changes including periodic testing, training of supervisors regarding drug abuse and its detection, and timely communications with the NRC are all indicative of the corporate policy.

In summary, improvements have been noted in the area of safety assessment, especially later in the period. These included changes in the corporate organization, improvement in oversight by shift and plant management, and changes in the NRB charter, procedures, and membership. However, the licensee's self-assessment capability was not sufficiently developed or focused to identify and correct weaknesses in the security and emergency preparedness areas.

2. Performance Rating

This area was rated Category 2.

3. Board Recommendation

The licensee should develop its self-assessment capability so that it can prevent the types of problems identified in the emergency preparedness and security areas.

V. SUPPORTING DATA AND SUMMARIES

A. Investigations and Allegations

The NRC Office of Investigations completed a special investigation of an allegation that licensed operators were asleep or otherwise inattentive to their duties while on shift. Enforcement action was taken after the end of the period, as noted below.

Twenty-three allegations were received during the assessment period in the following areas:

- radiation protection - 7
- security - 6
- fitness for duty - 5
- QA/QC concerns - 2
- industrial safety - 2
- operations - 1

One allegation in the area of radiation protection was judged a violation, but the other six were unsubstantiated. The majority of the security allegations pertained to concerns about personnel practices such as excessive overtime, long hours at a guard post, harassment, and low morale as a result of unfavorable working conditions. These allegations resulted in an attempt by the licensee to rectify these unfavorable working conditions and the replacement of a contractor. The fitness-for-duty (drug-use) allegations were unsubstantiated. The two QA/QC concerns were unsubstantiated. The industrial safety and the operations allegations are not resolved.

B. Escalated Enforcement Actions

A level III violation and $50,000 civil penalty were issued on July 29, 1987 because of Appendix R fire protection violations.

A level II violation and $1,250,000.00 civil penalty (Enforcement Action 88-04) were issued on August 10, 1988 because of the inattentiveness of control room operators and management's failure to detect and/or correct the problem. A total of 14 level II and 22 level III violations were issued to 36 licensed control room operators on August 9, 1988. Civil penalties were imposed on 33 of these 36 operators.

Although these enforcement actions were issued after the assessment period (July 31, 1988), they are included here for completeness.

C. Management, Enforcement, and Other Conferences

On June 17, 1987, a management meeting was held to discuss the status of the actions in response to the NRC order.

On June 23, 1987, NRC representatives attended the Harford County (MD) Council meeting to discuss the status of the NRC order.

On July 13, 1987, a management meeting was held to discuss the licensing of General Electric engineers.

On July 15, 1987, a management meeting was held to discuss licensee response to the NRC order, including its recovery plan (Commitment to Excellence).

On July 30, 1987, a management meeting was held to discuss licensing issues regarding containment and fire protection.

On August 3, 1987, an enforcement conference was held to discuss the control room ventilation radiation monitoring system piping discrepancy.

On August 26, 1987, a management meeting was held to discuss the status of the CTE Action Plan.

On September 9, 1987, a management meeting was held to discuss Unit 3 pipe replacement activities.

On September 14, 1987, an NRC Commission briefing on Peach Bottom was held.

On September 24, 1987, public meetings were held in Harford County, MD and York County, PA, to receive questions on the restart plan.

On October 1, 1987, a SALP management meeting was held on site.

On October 7, 1987, a management meeting was held to discuss radiological controls for the Unit 3 pipe replacement outage.

On October 16, 1987, a meeting was held to discuss technical issues with the Harford County (MD) Council.

On November 4, 1987, a public meeting was held in Lancaster County, PA, to receive questions on the restart plan.

On November 20, 1987, a management meeting was held to discuss the status of the restart plan.

On December 3, 1987, the ACRS was briefed on Peach Bottom status.

On December 22, 1987, a management meeting was held to discuss the status of the restart plan.

On January 27, 1988, a management meeting was held to discuss the status of the restart plan.

On February 17, 1988, a management meeting was held to discuss the licensee's proposed QA organizational and programmatic changes associated with corporate and site reorganization.

On February 26, 1988, a management meeting was held to discuss health physics and security concerns.

From January through May 1988, individual licensed operator enforcement conferences were held.

On March 31, 1988, a management meeting was held to discuss the status of the restart plan.

On May 16 and 17, 1988, public meetings were held in Harford County, MD, and York and Lancaster Counties, PA, to receive questions on the revised restart plan.

On May 19, 1988, a management meeting was held to discuss questions on the restart plan.

On June 9 and July 20, 1988, management meetings were held to discuss security plan implementation issues.

D. Licensee Event Reports

1. Report Quality

By using the basic evaluation methodology presented in NUREG-1022, Supplement 2, the NRC found that the overall quality of Peach Bottom licensee event reports (LERs) is very good. Overall, LERs were thorough, detailed, and generally well written and easy to understand. The narrative sections typically included specific details of the event such as valve identification numbers, model numbers, number of operable redundant systems, and the date of completion of repairs to provide a good understanding of the event. The root cause of the event was clearly identified in most cases, although a large number of events initially had an "unknown" root cause. LERs generally presented the information on the event in an organized manner with separate headings and specific information in each section that led to a clear understanding of the information. Previous similar occurrences were properly referenced in the LERs as applicable. The licensee updated LERs in the assessment period for various reasons, including the completion of corrective actions in the LERs and to extend commitment dates that were not met.

The LERs generally described all the major aspects of the event, including component or system failures that contributed to the event and the significant corrective actions taken or planned to prevent recurrence. However, there were some examples of poor description of events (especially those of complex events) such

as those in Unit 2 LER 88-05, which does not state which control room panels were affected and which systems were subject to failure. Similarly, Unit 2 LER 87-32 does not state which plant systems could have been affected. In addition, lack of information resulted in poor event assessment sections in these LERs because they did not clearly state what redundant or mitigating systems were available and what the event progressions would have been. This lack of an adequate description of the event and of the assessment of safety significance resulted in difficulties in assessing and classifying events.

2. Causal Analysis

		Number	Percent
A.	Personnel Error	25	43
B.	Design/Manuf./Constr./Install.	8	14
C.	External Cause	2	3
D.	Procedure Inadequacy	9	15
E.	Component Failure	13	22
X.	Other (including unknown)	2	3
	TOTAL	59	100

A tabulation of LERs by functional area is attached as Table 3.

LERs 02-87-07 through 02-88-20 for Unit 2 and 03-87-06 through 03-88-07 for Unit 3 were received and reviewed by the NRC during the assessment period.

The 59 LERs that were submitted during the assessment period were also subject to an ongoing review as part of NRC inspections for trends and identification of root causes. The following sets of common mode events were identified:

- Twenty-five LERs were attributed to personnel error. These LERs accounted for approximately 43 percent of the events reported, an increase over that reported during the previous assessment period.

  A review of the LERs indicates that some areas of the plant are subject to recurring problems. In particular, many repetitive events involved personnel errors associated with equipment blocking and tagouts, especially of electrical equipment and control logic. The large number of similar events indicates that actions taken to prevent recurrence were ineffective.

- Eight LERs were attributed to design, manufacturing, construction, or installation problems. Areas of potential safety concern are seismic qualification and design and installation of equipment. The fact that deficiencies have existed since initial construction that could have affected large numbers and diverse types of equipment is significant. A large number of these events were identified by the licensee, but others were identified as a result of NRC inspector concerns.

- Nine LERs were a result of procedural deficiencies. This represents an increase over those during the previous period, and can be partially attributed to the increased sensitivity in regard to procedural compliance and actions taken to note and revise deficient procedures.

- Component failures accounted for 13 LERs during the period. This represents a negligible decrease in component failures over those experienced during the previous period. A detailed review did not indicate any maintenance program, procedure, or performance problems that may have contributed to the failures.

- Fourteen LERs involved the failure of fuses and other electrical equipment.

- Twenty LERs were late. This indicates that the mechanisms for identifying and tracking potentially reportable occurrences are inadequate.

Table 1 Distribution of Inspection Hours

Peach Bottom Atomic Power Station

June 1, 1987-July 31, 1988

Functional Area	Hours		Percent of Time
	14 Months	Annualized	
Plant Operations	2355	2019	32
Radiological Controls	591	507	8
Maintenance/Surveillance	2413	2068	33
Emergency Preparedness	276	237	4
Security and Safeguards	613	525	8
Engineering/Technical Support	1145	981	15
Safety Assessment/Quality Verification *	--	--	--
Totals	7393	6337	100

*Hours expended in the area of safety assessment/quality verification include other functional areas.

Inspection hours include NRC Inspection Reports 87-16/16 through 88-27/27, but do not include those that will be documented in Inspection Report 88-24/24.

Table 2 Enforcement Summary*

Peach Bottom Atomic Power Station

June 1, 1987 - July 31, 1988

Functional Area	Severity Level III	IV	V	Subtotal
Plant Operations	1	2	0	3
Radiological Controls	0	3	0	3
Maintenance/Surveillance	0	7	0	7
Emergency Preparedness	0	1	0	1
Security and Safeguards**	0	3	0	3
Engineering/Technical Support	0	0	1	1
Safety Assessment/Quality Verification	0	3	1	4
Totals	1	19	2	22

*Escalated enforcement against the licensee and licensed operators occurred on August 9 and 10, 1988 (Section V.B). This was outside the assessment period and is not tabulated.

**Potential violations from NRC combined inspection report 88-26/26 were under review and are not tabulated.

Table 3 Licensee Event Reports

Peach Bottom Atomic Power Station

June 1, 1987-July 31, 1988

Functional Area	Number by Cause*						
	A	B	C	D	E	X	Subtotal
Plant Operations	9	2	2	5	9	1	28
Radiological Controls	1	0	0	0	0	0	1
Maintenance/Surveillance	14	1	0	4	4	1	24
Emergency Preparedness	0	0	0	0	0	0	0
Security and Safeguards**	--	--	--	--	--	--	--
Engineering/Technical Support	1	5	0	0	0	0	6
Safety Assessment/Quality Verification	0	0	0	0	0	0	0
Totals	25	8	2	9	13	2	59

*Cause codes:
A. Personnel error
B. Design, manufacturing or installation
C. Unknown or external cause
D. Procedure inadequacy
E. Component failure
X. Other

**Security event reports were not tabulated and are discussed separately in Section III.F.

LER tabulations include LERs 02-87-07 through 02-88-20 for Unit 2 and 03-87-06 through 03-88-07 for Unit 3.

Table 4 History of SALP Reviews at Peach Bottom Atomic Power Station

Functional Area	Categories and Review Periods							
	2/86-5/87	4/85-1/86	1/84-3/85	3/83-12/83	3/82-2/83-	7/81-6/82	7/80-6/81	5/79-6/80
Plant Operations	Unsat	2	2	2	2	2	2	Sat
Radiological Controls	2	2	3	2	3	3	2	Sat
Maintenance	2	2	1	2	2	2	2	Sat
Surveillance	2	2	2	2	3	2	1	Sat
Fire Protection/ Housekeeping	3	2	2	2	3	3	3	Sat
Emergency Preparedness	2	2	2	2	1	2	2	Sat
Security and Safeguards	2	3	3	1	1	2	2	Sat
Refueling/Outage Activities	N/A	1	1	2	2	2	1	Sat
Training and Qualification Effectiveness	Not Rated	2	N/A	N/A	N/A	N/A	2	Sat
Assurance of Quality	Unsat	3	N/A	N/A	N/A	N/A	2	Sat
Licensing Activities	2	2	1	1	2	1	N/A	N/A
Technical Support	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTE: Unsat = unsatisfatory
Sat = satisfactory
N/A = not applicable