SAFETY EVALUATION REPORT
ON THE PHILADELPHIA ELECTRIC COMPANY'S PLAN
FOR RESTART OF THE PEACH BOTTOM ATOMIC POWER STATION

U.S. Nuclear Regulatory Commission
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ABSTRACT

On March 31, 1987, the U.S. Nuclear Regulatory Commission issued an order to shut down the Peach Bottom Atomic Power Station, Units 2 and 3, operated by the Philadelphia Electric Company, because the NRC no longer had reasonable assurance that the facility would be operated in a manner to ensure that the health and safety of the public would be protected. The associated issues included inattentiveness of control room operators to their licensed duties and the failure of plant and corporate management to properly identify and correct the problem.

In response to requirements of the shutdown order, the licensee identified the root causes of these problems and proposed corrective actions in the "Plan for Restart of Peach Bottom Atomic Power Station," as revised on April 8, 1988. The NRC staff's evaluation of this plan and several supporting documents is presented in this safety evaluation report.

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1 INTRODUCTION AND PURPOSE

The Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, operated by the Philadelphia Electric Company (PECo, the licensee), is a 1098-Megawatt electric boiling-water reactor designed by the General Electric Company and located about 19 miles south of Lancaster in York County, Pennsylvania. Units 2 and 3 were licensed to operate in 1973 and 1974, respectively.

In March 1987, the Nuclear Regulatory Commission (NRC) received information that control room operators at Peach Bottom had been observed sleeping while on duty in the control room, reading materials not directly job related, and being otherwise inattentive to licensed duties. The NRC confirmed this information during the initial phase of an investigation and determined that all levels of plant management at that time either knew or should have known of these facts and took either no action or inadequate action to correct this situation. As a result, the NRC staff no longer had reasonable assurance that the facility would be operated in a manner to ensure that the health and safety of the public would be protected and issued an order to PECo on March 31, 1987, suspending operations of the Peach Bottom station.

Subsequently, the NRC determined that the inattentiveness described in the order had occurred over an extended period of time and was pervasive and that the failure by site and corporate management to identify, investigate, and correct these conditions and report them to the NRC demonstrated a significant lack of management attention to, and control of, operations at Peach Bottom.

The order issued to the licensee required, among other things, that before the licensee proposed to again operate either unit above the cold shutdown condition the licensee would provide for NRC approval a detailed and comprehensive plan to ensure that the facility would be operated safely and would comply with all requirements.

In response to the order, the licensee eventually identified four principal root causes of the issues that led to the shutdown of the Peach Bottom units and proposed a plan for restart that included discrete tasks to correct these root causes of the problem.

In this safety evaluation report (SER), the staff evaluates the adequacy of the licensee's response to the requirement of the shutdown order, as set forth in the plan for restart. The staff has based its findings on several sources of information including that provided in Sections I and II of Revision 1 of the plan for restart, submitted on April 8, 1988, and in responses to NRC requests for additional information, submitted by letters on July 22, August 15 (two), 22, and 23, and September 7 and 20, 1988. The staff gained more information from the numerous enforcement conferences that were conducted with previously and currently licensed personnel at Peach Bottom station and a number of onsite inspections and audits, which will be documented in respective inspection reports.

1.1 Approach to the Restart Plan Review

The NRC's approach to the review of issues associated with the Peach Bottom shutdown involves several major programmatic elements. These elements include enforcement actions, as discussed in Section 2.2 of this SER; the review of PECo's program plan for restart, as addressed throughout this report; the NRC inspection program, as discussed in Section 1.2 below; consideration of comments made by the State of Maryland and the Commonwealth of Pennsylvania; and the involvement of the public as discussed in Section 1.3 below.

When a nuclear facility is shut down for safety reasons, the NRC's criteria for consideration of restart require that specific corrective actions be satisfactorily implemented before the plant can be permitted to restart. In the case of Peach Bottom station, the shutdown issues were identified in the NRC's shutdown order of March 31, 1987, and in the accompanying notice in the Federal Register (52 FR 11386). These issues are itemized in PECo's restart plan and are listed in Section 2.2 of this report. The NRC required PECo to identify the root causes of the issues that led to the shutdown as well as the appropriate corrective actions to address the root causes. These corrective actions involved substantial changes in personnel, organizational interactions, and procedural implementation at all levels of the PECo organization. PECo's plan for restart defines the needed changes. Once the NRC has accepted this plan as satisfactory to bring about the needed changes, fulfillment of the requirements of this plan becomes the essential restart criteria. The staff's acceptance of PECo's plan for restart is conveyed by this report.

This SER gives the results of the staff's evaluation of the licensee's programmatic response to the shutdown order as set forth in the licensee's plan for restart. The staff will determine the effectiveness of the implementation of the plan and if it is having the desired effect in correcting the problems that have been identified at Peach Bottom. This is done primarily through the staff's inspection program, including the monitoring of future performance trends.

The licensee's plan for restart identified nine shutdown issues from the shutdown order. The licensee then identified four root causes for these issues. The licensee developed corrective action objectives to be attained to resolve each of the four root causes and also developed specific corrective actions to meet each of the objectives. The relationship between the shutdown issues, the root causes, the corrective action objectives, and the corrective actions is provided in appendices to the licensee's restart plan. The schedular status of implementation of the corrective actions is provided periodically. The staff's objectives in reviewing the licensee's restart plan are (1) to establish that the licensee's identification of the root causes is appropriate, (2) to establish whether or not the scope of the corrective action objectives and tasks is adequate to address the root causes, and (3) to establish whether the completion dates for the corrective actions and major activities are consistent with NRC staff requirements for restart.

The NRC established the Restart Assessment Panel to review the licensee's restart plan. The panel includes members from the NRC's staff in Region I and from the Office of Nuclear Reactor Regulation staff. The format of this report* is consistent with the format used by the licensee in its plan for restart. Therefore, Sections 3, 4, 5, and 6 of this SER deal respectively with the root causes attributed to the corporate organization, as described in Section I of the restart plan, and with the root causes attributed to station management, operator resources development, and cultural changes, as described in Section II of the restart plan.

1.2 Other Related Activities

In addition to the enforcement actions and the staff's review of the restart plan, the staff also has numerous other activities under way with regard to Peach Bottom station.

These activities include the preparation of a report on the results of the staff's systematic assessment of licensee performance (SALP) for the period of May 31, 1987, to July 31, 1988. In addition to pursuing the program of regular inspections, the staff is conducting inspections of licensee activities in several specific areas. These include inspection of the maintenance program, the emergency operating procedures, and plant security and safeguards. An integrated performance assessment of the licensee's response to shutdown-related issues also will be performed to determine the licensee's overall readiness for restart. The results of these inspection efforts will be reported in separate inspection reports.

The results of these other related activities also will be considered in the staff's basis for making a recommendation on restart of the plant.

1.3 Public Comments

The staff was concerned that members of the public had views or concerns on the issues to be addressed in any restart decision that had not otherwise been addressed in correspondence to the NRC. To ensure that all members of the public had an opportunity to comment on the licensee's restart plan, the staff held meetings to receive comments from members of the public in the vicinity of the Peach Bottom site.

Public comments and the staff's response to them as they relate to issues associated with the shutdown are discussed in Appendix C to this report.

*The staff has added Appendices A, B, and C, which provide the chronology of correspondence between the NRC and the licensee, the bibliography, and public comments and NRC response to the comments, respectively.

2 BACKGROUND

2.1 Performance Before the Shutdown

Enforcement history before March 1987 identified instances of inattention to duty or failure to adhere to procedures on the part of licensed operators in the control room at Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. These instances and the resulting shutdown order were published in the Federal Register (52 FR 11386) and are summarized below.

On June 10, 1985, an NRC inspector observed a reactor operator on duty apparently asleep or otherwise inattentive to his duties. An enforcement conference was held concerning this matter on June 21, 1985.

On June 6, 1986, the NRC issued its report of the systematic assessment of licensee performance (SALP) for Peach Bottom and concluded that management involvement and effectiveness in improving operations activities was not evident. The report stated that inadequate management involvement was indicated by poor dissemination of management goals and policies, poor communications between different departments and divisions, and management's focus on compliance rather than acknowledgement and correction of the root causes of problems. Further, the report concluded that a complacent attitude toward procedural compliance in plant operations was evident.

On June 9, 1986, the NRC issued a Notice of Violation and Proposed Civil Penalty for several violations that resulted from errors by licensed operators. These personnel errors indicated a pattern of inattention to detail, failure to adhere to procedural requirements, and a generally complacent attitude by operations personnel toward performance of their duties. This NRC assessment was emphasized in a letter dated June 12, 1986, from the NRC's Executive Director for Operations to the licensee's Chairman of the Board and Chief Executive Officer. In addition to this civil penalty, three previous civil penalties had been issued for violations to the Technical Specifications that involved personnel errors.

2.2 Shutdown Order and Subsequent Events

On March 24, 1987, the NRC's Region I office received further information that operators at Peach Bottom had been observed sleeping while on duty in the control room and were otherwise inattentive to their license obligations. The NRC determined that all levels of plant management at that time either knew or should have known of these facts and took either no action or inadequate action to correct this situation. As a result, the NRC no longer had reasonable assurance that the facility would be operated in a safe manner and ordered Peach Bottom Unit 3 to be shut down and both units to be maintained in the cold shutdown condition pending further order.

The order 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 provided its "Commitment to Excellence Action Plan" on August 7, 1987, in response to the NRC order. This commitment-to-excellence (CTE) plan identified four principal root causes of the problems and areas wherein changes were being made to address the concerns as well as a proposed list of tasks and associated schedules to resolve these concerns.

The CTE plan stated the root causes as

- poor leadership by plant management
- failure to initiate timely licensed operator replacement training programs
- a station culture, which had its roots in fossil and pre-Three Mile Island operations, that had not adapted to changing nuclear requirements
- slowness on the part of corporate management to recognize the developing severity of these problems and take sufficient corrective action

Areas identified by the licensee wherein changes were being made included

- plant management changes
- licensed operator attitudinal assessment and training
- additional licensed operator resources
- site-wide attitudinal change
- procedure upgrade and compliance
- quality assurance program improvements
- management involvement and communications

The staff subsequently requested additional information about the CTE plan in letters dated August 24 and September 11, 1987. The licensee responded to these in its submittal of September 28, 1987.

The staff reviewed the licensee's response of September 28, 1987, and identified several major concerns, which it expressed by letter dated October 8, 1987. The staff concluded that the licensee had not addressed a fundamental concern regarding the previous inability of the licensee to self-identify problems, and implement timely and effective corrective action. The staff also concluded that the CTE plan did not contain sufficient information to establish the relationship between the specific root causes and the actions proposed to address them. On the basis of these concerns, the staff deferred further review of the CTE plan pending receipt of a revised plan that addressed the expressed concerns.

In the fall of 1987, the licensee undertook a major reorganization of its site and corporate staff (shown in Figures 2.1 through 2.6 at the end of Section 2). The revised organizational structure associated with this reorganization was reflected in an application dated November 19, 1987, for amendment to the Technical Specifications with regard to administrative controls. The revised organizational structure was subsequently approved in amendments to the Technical Specifications as issued on June 22, 1988. Figure 2.5 shows the structure existing at the time of the shutdown and Figure 2.6 shows the revised structure.

The licensee, in a submittal dated November 25, 1987, stated that it had completed an indepth analysis of (1) its corporate organization and systems for

management and support of its nuclear operations and (2) its ability to identify its own problems and to take prompt corrective actions. This submittal included the first of two sections of a revised corrective action plan entitled "Plan for Restart of Peach Bottom Atomic Power Station," Section I, "Corporate Action" (restart plan). The revised plan reflected the new organization and responded to the concerns expressed in the staff's letter of October 8, 1987. Specifically, the root cause with regard to self-assessment was restated as follows: "Corporate management failed to recognize the developing severity of the problems at PBAPS and thus, did not take sufficient corrective actions."

The revised plan also responded to the staff's concern with regard to establishing a connection between the root causes and their corrective action tasks. Specifically, the licensee listed nine shutdown issues from the shutdown order and correlated these issues with the four root causes, the corrective action objectives to address the root causes, and the corrective actions and major activities required to implement these objectives. The shutdown issues are listed below with the appropriate designation of the restart plan given in parentheses. The shutdown issues and the previously discussed correlation are shown in Appendices C and A to Sections I and II, respectively, of the restart plan.

Shutdown Issues

- Operations control room staff periodically slept or have otherwise been inattentive to licensed duties. (SD-1)

- Pattern of inattention to detail, failure to adhere to procedural requirements, and a generally complacent attitude by the operations staff toward performance of their duties. (SD-2)

- Management at the shift supervisor and shift superintendent level have either known and condoned the facts (SD-1) or should have known of these facts. (SD-3)

- Plant management above the shift superintendent position either knew or should have known the facts (in SD-1) and either took no action or inadequate action to correct this situation. (SD-4)

- The licensee must have and implement procedures to ensure that activities affecting quality, including operations of the facility, are satisfactorily accomplished. The Peach Bottom quality assurance program has failed to identify this condition adverse to safety. (SD-5)

- The licensee, through its enforcement history and from what has been developed by the ongoing investigation, knew or should have known of the unwillingness or inability of its operations staff to comply with Commission requirements, and has been unable to implement effective corrective action. (SD-6)

- Lack of adequate management involvement: poor dissemination of management goals and policies. (SD-7)

- Lack of adequate management involvement: poor communications between different departments and divisions. (SD-8)

- Lack of adequate management involvement: focus on compliance rather than acknowledgement and correction of the root causes of problems. (SD-9)

The first section of the restart plan addresses the corporate-level actions and the related root cause. The licensee submitted the second section of the restart plan on February 12, 1988; it addresses the other three root causes.

On January 11, 1988, the president of the Institute of Nuclear Power Operations (INPO) provided a report on the Peach Bottom restart issues to the PECo Board of Directors. INPO requested that the letter and accompanying report be provided to the NRC as well as to others. By letter dated January 29, 1988, the president of the Philadelphia Electric Company provided the INPO report to the NRC. By letter dated March 4, 1988, the staff requested that it be provided with any information that the licensee would give to INPO concerning the restart issues. The staff also requested that the licensee inform the staff of the results of forthcoming INPO evaluations of station and corporate readiness for restart.

Changes in the licensee's senior management personnel took place in March 1988. The Chairman of the Board/Chief Executive Officer and the President/Chief Operating Officer retired from the company. The Senior Vice President-Nuclear moved over to take charge of the completion-of-construction effort at the licensee's Limerick Generating Station, Unit 2. These people were replaced by a new Chairman, President, and Chief Executive Officer, Mr. Joseph Paquette, and by a new Executive Vice President-Nuclear, Mr. Corbin McNeill. In joint response to these changes and to certain recommendations made in the INPO report, the licensee submitted Revision 1 to the plan for restart on April 8, 1988.

The staff issued requests for additional information on the revised restart plan on June 1, 1988. The licensee responded to these requests, as well as to issues raised by the State of Maryland, by letters dated July 22, August 15 (two letters), August 22, and August 23, 1988. The licensee indicated that it was continuing with its development of responses to issues raised by the Commonwealth of Pennsylvania.

On August 9 and 10, 1988, the NRC issued enforcement actions to individuals that comprised the shift operations staff at Peach Bottom at the time of the shutdown order and to PECo, respectively.

The decision to initiate enforcement action against PECo and its employees was based on the results of a report prepared by the NRC Office of Investigations in December 1987. This report included the findings of an extensive investigation conducted by the PECo Claims Security Division that was provided to NRC in August 1987. After considering the information from these investigations, a meeting was held with PECo on December 22, 1987, to obtain additional information to assist the staff in determining whether and, if so, what kind of enforcement action was appropriate. This meeting focused primarily on the basis for PECo's retaining certain of its operators in light of PECo's own investigation and on those corrective actions PECo was taking to address operator inattentiveness.

Thereafter, enforcement conferences were scheduled with each of the current and former licensed operators and a member of the Peach Bottom operations staff

shift work complement at the time of the shutdown or shortly before. These conferences were held beginning in February 1988 after the operators had completed their retraining so that the staff could consider the effectiveness of each person's rehabilitation before the NRC made an enforcement decision. The staff gave serious consideration to the full range of enforcement actions for the operators, including revoking their licenses. In considering the question of enforcement actions against these people, the staff did not need to consider revocation of the licenses for the shift superintendents who were the senior licensed individuals and supervisors on shift because PECo had already removed them from licensed duties. Consequently, their licenses were terminated by action of the Commission's regulations. In addition, one of the operators resigned from the company and two others decided not to continue with licensed duties. These enforcement conferences were completed in May 1988.

The staff did not believe that the remaining operators should have their licenses suspended for the following reasons:

(1) These operators had undergone an extensive rehabilitation program designed to ensure that they had a better understanding of their individual responsibilities under their NRC licenses and to ensure that such conduct does not recur.

(2) During the enforcement conference, each of the operators was candid and forthcoming in his statements, admitting to some form of inattentiveness to the extent it violated his license and admitting for the most part, notwithstanding opportunities to blame facility management, that he was individually responsible.

(3) Although the operators were individually responsible, the PECo corporate, plant, and shift management certainly bears a large responsibility for the climate which permitted pervasive inattentiveness to exist.

(4) The technical knowledge and experience of the licensed operators is high, such that retaining some licensed operators, subject to successful rehabilitation, would be in the interest of reactor safety.

(5) The rehabilitation of selected operators appears to have been successful.

For these reasons, the staff recommended, and the Commission supported, the decision not to revoke the operators' licenses. Nevertheless, further enforcement action in the form of civil penalties was appropriate for all but the newest operators (1) to stress that improper actions and poor attitudes of the operators, with the potential for affecting safe operation of the facility, will not be tolerated and (2) to emphasize their individual responsibility to the NRC. Civil penalties were included for former operators because (1) the action occurred when they were licensed, (2) the purpose of the penalty is not only to address individual performance but to deter others, and (3) some of the individuals may be involved in nuclear activities in the future.

With regard to enforcement action against PECo, the staff considered the following:

(1) The plant was shut down by NRC order, has remained shut down despite various submittals of corrective actions, and will remain shut down until the NRC has reasonable assurance that appropriate measures have been taken to prevent recurrence.

(2) The shutdown order and its associated shutdown costs (reported by PECo in its last annual report to be $58 million for 1987) should have sent a clear message to PECo, as well as to all other licensees, that the NRC will not tolerate such conduct and will apply its enforcement authority, when warranted, to ensure that such conduct does not occur.

(3) There have been significant personnel and management changes at several levels within the company.

The civil penalty action was taken to highlight to PECo and other licensees the consequences of the failure of corporate management to be aware of conditions such as those at Peach Bottom and the failure to take appropriate corrective action, particularly in light of the pervasiveness of the conditions and PECo's prior enforcement history. These failures constitute a very significant regulatory concern and are considered the primary cause of the events that contributed to issuance of the shutdown order. In the staff's view, available sanctions such as civil penalties should be used so that this licensee, as well as other licensees, will recognize that in addition to the cost of corrective action for violations, civil penalties will be added to increase the cost associated with significant safety deterioration so as to increase the deterrent value.

2.3 Philadelphia Electric Company Organization

Since Peach Bottom station was shut down on March 31, 1987, the licensee has been developing and implementing management and technical programs to address the NRC concerns that led to the shutdown. The licensee responded to these concerns in its restart plan, which is described below.

The licensee has revised its corporate organizational structure to provide an organization dedicated only to nuclear power activities (the nuclear organization) with direct management authority and responsibility over all aspects of nuclear operations, engineering, maintenance, and construction. The new nuclear organization will be headed by an Executive Vice President-Nuclear with nuclear responsibilities only. This nuclear organization has been formed by separating nuclear engineering, maintenance, and other support activities for nuclear operations from corresponding support activities for fossil and hydro production and by reassigning the resources for these activities to the new nuclear organization. The former positions of Senior Vice President-Nuclear Power, Nuclear Production Manager, Superintendent-Nuclear Generation Division, Superintendent-Nuclear Services, and Manager-Nuclear Plant have been abolished and the functions under these positions have been reassigned within the new organization under the Executive Vice President-Nuclear. A comparison of the former organizational structure with the current structure can be made using Figures 2.5 and 2.6. Figures 2.1 through 2.4 show the current corporate and site organizational structure.

There are three staff organizations and five line organizations that report to the Executive Vice President-Nuclear, as shown in Figure 2.1. The five line organizations have responsibility for the Limerick Generating Station, Unit 2 construction, the corporate Nuclear Engineering and Nuclear Services groups, and the operating site groups at Peach Bottom and Limerick. The three licensee staff organizations have responsibility for the corporate Nuclear Review Board (NRB), Nuclear Quality Assurance (NQA), and Organization and Management Development.

2.3.1 Peach Bottom Site Group

The licensee has established a corporate office of Vice President-Peach Bottom Atomic Power Station (VP-PBAPS) at the site. This office has overall control of the conduct of activities of organizations at the Peach Bottom site. There are four line organizations that result from the reassignment of previous functions as well as the addition of new functions. These are plant, support, projects, and training as shown in Figure 2.3. The PBAPS site organization is discussed further in Section 4 of this SER.

2.3.2 Nuclear Services Group

The Vice President-Nuclear Services is responsible for nuclear service activities that support both the Peach Bottom and Limerick stations. The Vice President-Nuclear Services, as shown in Figure 2.4, is responsible for the support, maintenance, training, and administration groups.

The Manager-Nuclear Support is responsible for licensing, fuel management, radiation protection, radioactive waste management, nuclear plant chemistry, emergency preparedness, nuclear plant security, and the Operating Experience Assessment Program.

The Manager-Nuclear Maintenance is responsible for the supplemental craft maintenance support that serves the maintenance organization at the nuclear facilities. These activities include mobile mechanical maintenance, mobile electrical maintenance, and centralized maintenance services.

The Manager-Nuclear Training is responsible for two branches: the Nuclear Training Section, which is responsible for licensed, accredited, and general employee training, and the Barbados Training Center, which is responsible for craft training for maintenance and construction workers.

The Manager-Nuclear Administration is responsible for coordinating and monitoring activities that support the nuclear organization, including personnel administration, budget and cost control, computer applications, and nuclear records management.

2.3.3 Nuclear Engineering Group

The Vice President-Nuclear Engineering is responsible for the management of engineering activities that support the Peach Bottom and Limerick stations. Reporting to the Vice President-Nuclear Engineering through the Manager-Nuclear Engineering, as shown in Figure 2.4, are the Manager-Engineering, Manager-Project Management, Manager-Engineering Design, and the Construction Superintendent, Limerick Generating Station (LGS), Unit 2.

The Manag[illegible]gineering is responsible for engineering designs, analyses, stu[illegible]nce, and expertise, as required, to support the safe and effective [illegible] of PECo's nuclear units.

The Manager-Project Management is responsible for the management of engineering projects for each station to ensure that all engineering work is defined, planned, scheduled, budgeted, implemented, and technically supported and evaluated in a timely and cost-effective manner. The Manager-Projects Management works with each station's project manager to coordinate each station's implementation of engineering projects.

The Manager-Engineering Design is responsible for providing conceptual design support, engineering design, and drafting services to support the development and implementation of nuclear plant modifications.

The Construction Superintendent, LGS, Unit 2, is responsible for planning, scheduling, coordinating, directing, and controlling the safety, quality, timeliness and cost effectiveness of all work associated with LGS, Unit 2, until fuel loading.

2.3.4 Nuclear Quality Assurance

The General Manager-Nuclear Quality Assurance (NQA) is responsible for maintaining an effective Nuclear Quality Assurance Program. The Manager-Peach Bottom Atomic Power Station Quality, Manager-Limerick Quality, Manager-Quality Support, Manager-Performance Assessment, and Manager-Independent Safety Engineering Group (ISEG) report to the General Manager-Nuclear Quality Assurance. Three of the groups, PBAPS Quality, LGS Quality, and Quality Support, perform functions related to ensuring compliance with regulatory requirements including 10 CFR Part 50, Appendix B. The other two groups, ISEG and Performance Assessment, provide independent assessments and oversight of operations, respectively. The NQA organization, as discussed further in Section 3.2.2 of this SER, has thus been expanded beyond being concerned only with typical quality assurance activities.

2.3.5 Nuclear Review Board

The Nuclear Review Board (NRB) is responsible for reviewing and auditing technical and managerial areas. Its composition has been revised to include outside nuclear executives. The NRB is discussed further in Section 3.3 of this SER.

2.3.6 Organization and Management Development

The Organization and Management Development Division, reporting to the Executive Vice President-Nuclear has been established to assist managers in improving the effectiveness of their organizations and to develop management resources. This group is discussed further in Section 6 of this SER.

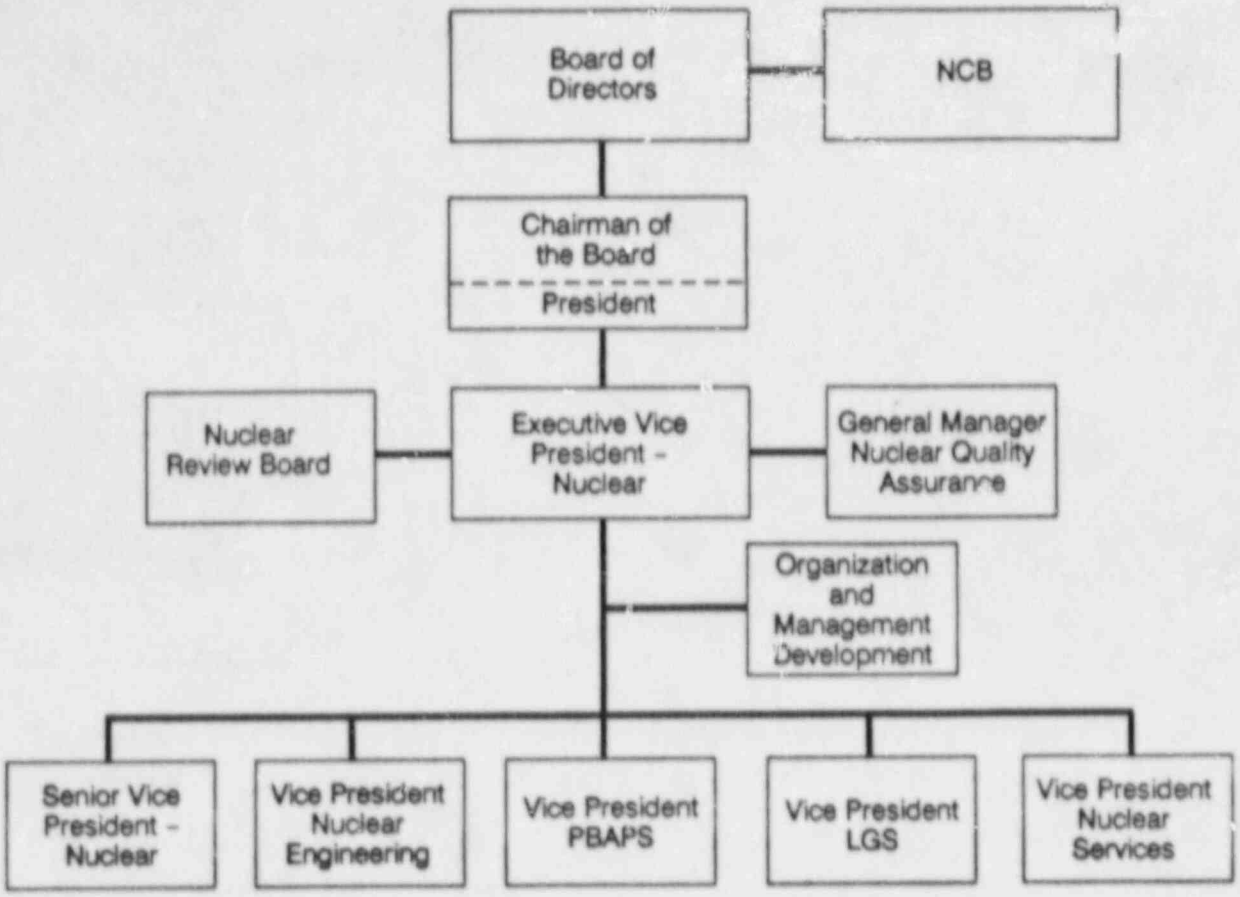


Figure 2.1 Corporate reporting structure for the nuclear organization

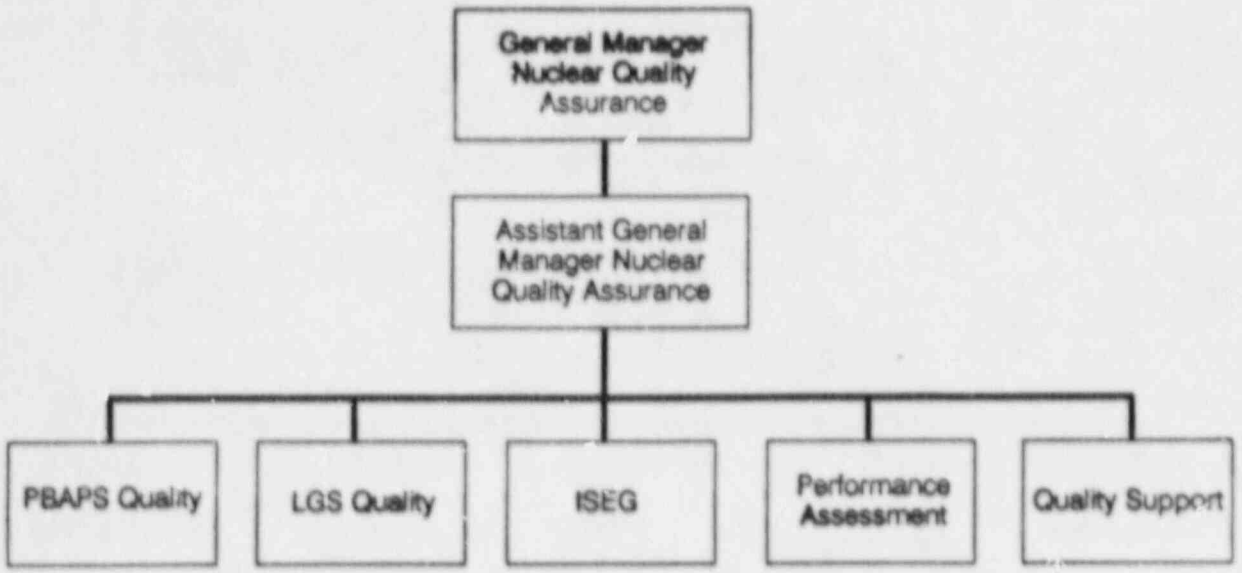


Figure 2.2 Nuclear quality assurance

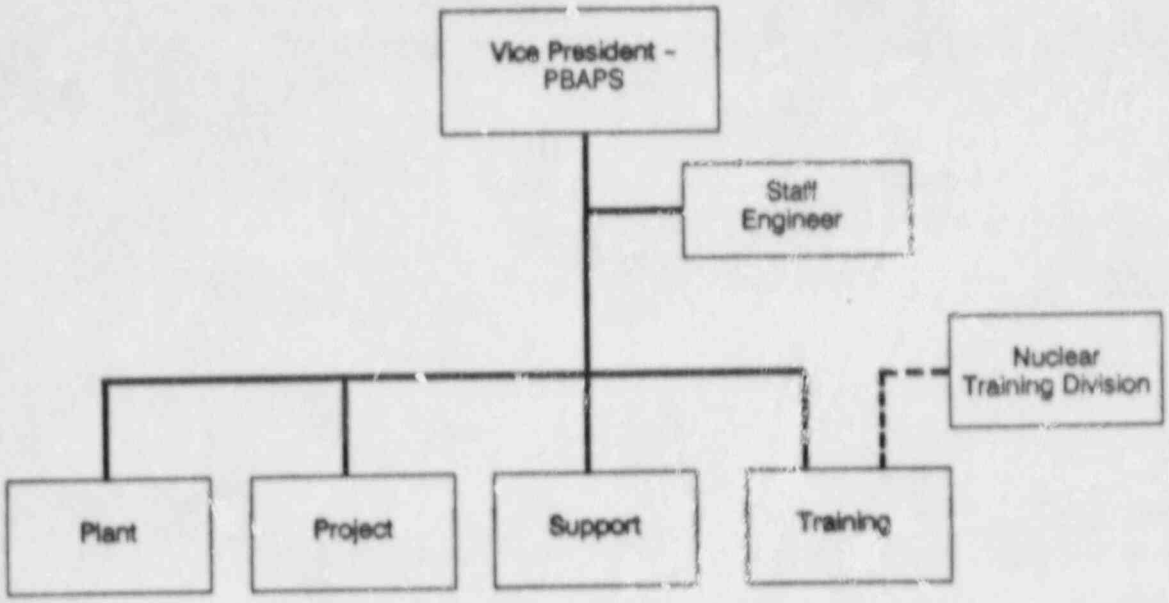


Figure 2.3 Site organization

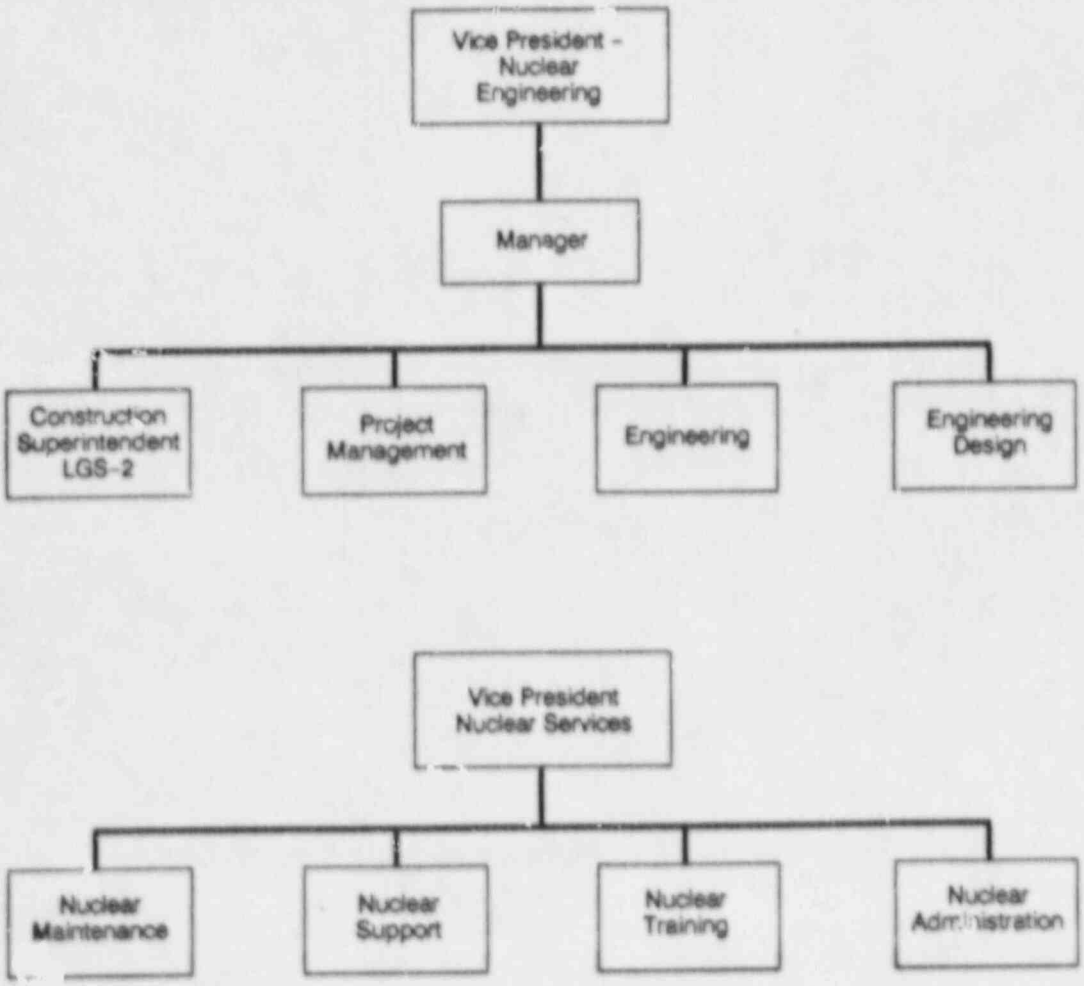


Figure 2.4 Nuclear engineering and nuclear services

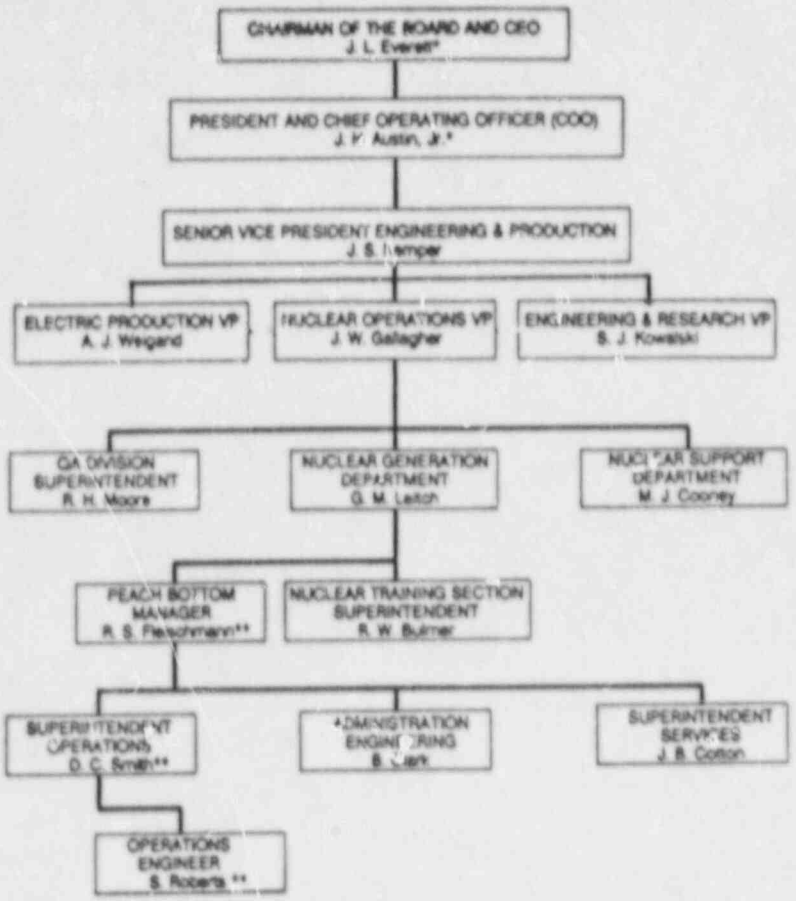
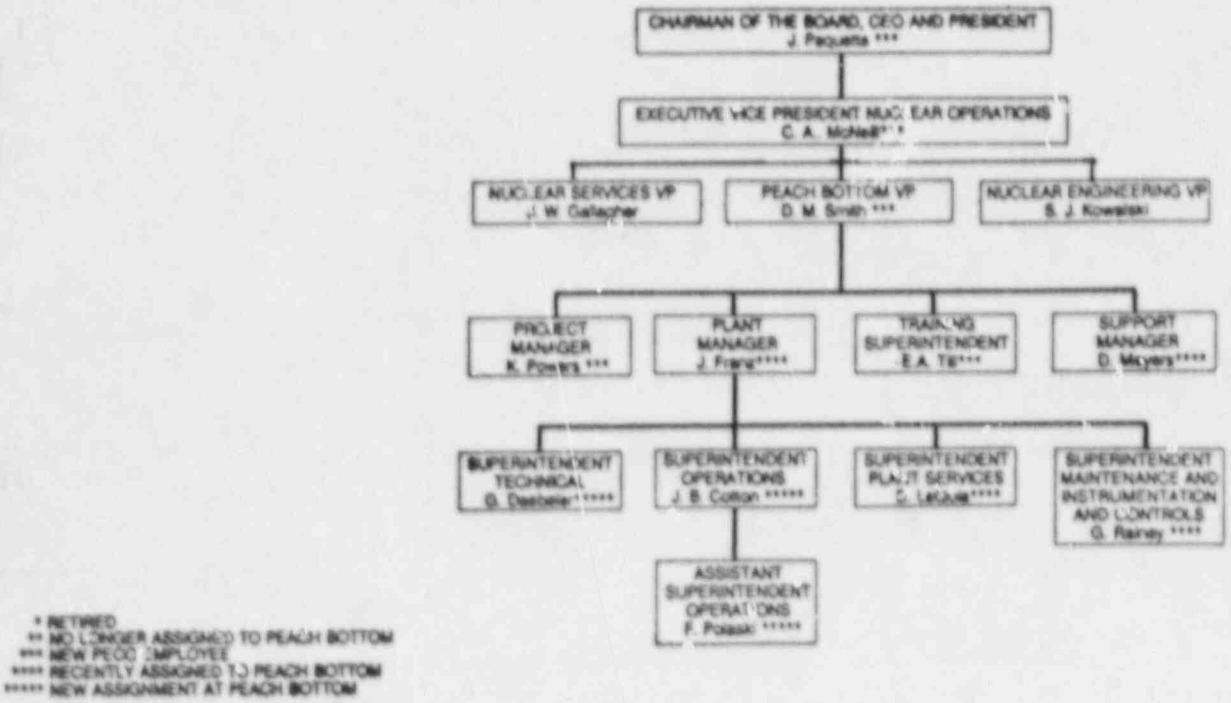


Figure 2.5 PECo organization on March 31, 1987, for Peach Bottom



* RETIRED
** NO LONGER ASSIGNED TO PEACH BOTTOM
*** NEW PECO EMPLOYEE
**** RECENTLY ASSIGNED TO PEACH BOTTOM
***** NEW ASSIGNMENT AT PEACH BOTTOM

Figure 2.6 PECo organization in September 1988 for Peach Bottom

3 CORPORATE MANAGEMENT

The licensee stated that the root cause of the failure of corporate responsibility was that "corporate management failed to recognize the developing severity of the problems at Peach Bottom Atomic Power Station (PBAPS) and thus, did not take sufficient corrective actions." To address this root cause, the licensee identified the following three corrective action objectives:

(1) Change the organizational structure to increase control, accountability, and corporate direction of nuclear operations.

(2) Develop the management systems and managerial skills that will strengthen self-assessment and problem resolution capabilities within the nuclear organization.

(3) Strengthen the independent assessment process to increase upper management's involvement in timely problem solving.

The staff evaluated these corrective action objectives and the corrective actions identified by the licensee to meet the objectives to determine if they constitute an adequate basis, from a corporate management standpoint, to support plant restart and continued safe operations. This evaluation of corporate management effectiveness involved an assessment of whether the plan for restart provides reasonable assurance (1) that the appropriate general management processes are occurring and are effective such that management is adequately involved in program direction, (2) that adequate levels of personnel accountability are attained, and (3) that a commitment to safety exists in the organization.

3.1 Organizational Restructuring for Increased Control, Accountability, and Corporate Direction of Nuclear Operations

To meet this objective the licensee identified the following four corrective actions: (1) development of a nuclear-dedicated organization, (2) reorganization of the corporate management team to include an onsite corporate officer, (3) establishment of accountability of onsite employees and, (4) clarification and documentation of management authorities and accountability.

3.1.1 Nuclear-Dedicated Organization

The licensee has implemented a revised corporate structure that differs from the former structure wherein a senior corporate executive had responsibility for nuclear power-generation activities as well as other company power-generation activities. The former structure involved a company-wide matrix arrangement to provide the engineering, maintenance, and construction support for nuclear operations. The present structure reflects a vertical integration of functions wherein the responsibility for all nuclear power activities is focused under the office of the Executive Vice President-Nuclear who reports to the Chief Executive Officer.

The revised organizational structure has been implemented as discussed in the licensee's activity item status report and in related Amendments 132 and 135 to the facility Technical Specifications for Units 2 and 3, respectively.

The licensee has identified the functions for each part of the organization in the restart plan, specifically as shown in summary form by Figures 3, 4, 5, and 6 and Appendix A of Section I of the restart plan. Other tasks involved the assignment of personnel to management positions, documentation of management and operating policies, development of organizational mission statements, a review of corporate personnel policies with respect to management authorities, and documentation of interface responsibilities on personnel management issues have been completed. Team building meetings have been held in support of these activities and to develop a transitional management plan. The licensee's transitional management process is directed at tracking the progress of the reorganization and resolving transitional issues in a timely manner.

These corrective actions are in response to shutdown issues SD-7, SD-8 and SD-9, which involved lack of adequate management involvement in dissemination of goals and policies, in communications between different organizations, and in focusing on root causes of problems. The staff concludes that the licensee's response, if effectively implemented, provides an adequate assurance of management involvement and personnel accountability in the establishment of a nuclear-dedicated organization.

3.1.2 Corporate Management Team and Accountability of Onsite Employees

The licensee has eliminated two management positions in the reporting chain and has added the corporate management position of Vice President-PBAPS who will be located on site. Regular staff meetings have been established with the Executive Vice President-Nuclear and those organizations that report to him, which include the Vice President-PBAPS. The Vice President-PBAPS will have full authority with regard to the work of all site organizations and all regular site employees except for those involved in independent assessment and oversight. The independence of these personnel as well as the accountability of the corporate Nuclear Maintenance Division to the Vice President-PBAPS are acceptable.

These corrective actions are in response to shutdown issues SD-6 and SD-8, which involved management's responsibility to be aware of compliance of its staff with regulatory requirements and with management involvement in communications between different organizations. The staff concludes that establishment of this senior onsite corporate management position in the manner defined increases management involvement in program direction because it provides a link between site activities and other levels of corporate senior management and between site activities and related corporate support activities. The staff also concludes that specification of the responsibilities and relationships of the Vice President-PBAPS as discussed above improves the accountability of personnel and organizations. The position of Vice President-PBAPS is also discussed in Section 4 of this SER.

3.1.3 Management Authorities and Accountability

Whereas the corrective action discussed in Section 3.1.1 above was to describe functional responsibilities for organizations, this corrective action was developed by the licensee to describe functional responsibilities and

transitional interface agreements for nine program areas that include the Operating Experience Assessment Program, the Commitment Tracking Program, configuration management, systems and project engineering, materials management, budget and cost control, and the Independent Safety Engineering Group (ISEG). The licensee also is developing position descriptions that reflect mission statements and interface agreements.

This corrective action is in response to shutdown issues SD-7, SD-8, and SD-9, which involved inadequate management involvement in dissemination of goals and policy, communications between different departments and divisions, and focussing on the root causes of problems. The staff concludes that, if effectively implemented, the establishment, documentation, and communication to the personnel involved in the implementation of these programs of the functional responsibilities and position descriptions will increase the effectiveness of these programs.

3.2 Improved Self-Assessment and Problem Resolution Within the Nuclear Organization

To meet this objective the licensee has made the following changes to provide its management with the structures and systems necessary to effectively monitor the three key areas of safety, quality, and organizational performance. The terms "nuclear employee" and "nuclear management" as used in this SER refer to those personnel dedicated to the licensee's nuclear power plant activities.

3.2.1 Philosophy for Assurance of Quality

The licensee has developed a ten-point program expressing its philosophy in regard to the assurance of quality. Six of the ten points address the responsibility of nuclear line management.

(1) Line management is responsible for ensuring the quality of the operations and services which it provides.

(2) Line management establishes performance goals to achieve excellence as well as the indicators to be used in assessing the performance of its organizations.

(3) Line management communicates regularly about the quality of operations with each other, its employees, and other company organizations through field visits, meetings, retreats, and written reports.

(4) Line management monitors the performance of its organization through direct observation and involvement in ongoing activities and ensures corrective action when there is a variance between actual performance and the indicators used to assess performance.

(5) Line management reports on its performance with respect to established goals.

(6) Line management is responsible for effectively closing out all open items on a timely basis.

Two of the ten points address the responsibilities of nuclear employees and of nuclear management reporting directly to the Executive Vice President-Nuclear:

(1) Every nuclear employee is responsible for identifying and reporting observed quality problems/deficiencies in a timely manner.

(2) Each individual reporting to the Executive Vice President-Nuclear is responsible for ensuring that effective problem/deficiency reporting programs are in place for employees to use.

Two of the ten points address the responsibilities of the Nuclear Quality Assurance (NQA) organization:

(1) The NQA organization is responsible for monitoring and assessing the performance of the other nuclear organizations and providing independent audit reports and evaluations to line management and upper management.

(2) The NQA organization is responsible for monitoring and assessing the effectiveness and timeliness of followup actions in regard to open items.

The licensee has committed to implement and support this philosophy as follows:

(1) Publish the philosophy in the company and site newspapers, display it on appropriate corporate and site bulletin boards, and refer to it in written and oral communication with nuclear employees.

(2) Establish a nuclear performance management program to achieve and maintain excellence (see Section 3.2.5 of this SER).

(3) Provide effective feedback information systems to ensure that line management is aware of the quality performance level of its organizations.

(4) Communicate management expectations for--and management's assessment of--quality performance during face-to-face employee performance reviews.

(5) Develop formal systems and informal programs for reporting problems related to quality.

The staff concludes that publication and implementation of this philosophy for the assurance of quality, as committed to by the licensee, provides an acceptable program for critical self-assessment and problem resolution within PECo's nuclear organization.

3.2.2 Nuclear Quality Assurance

The functional relationship of the Nuclear Quality Assurance (NQA) organization is shown in Figures 2.1 and 2.2 of this SER. The NQA organization has been strengthened by (1) elevating the reporting relationship to the Executive Vice President-Nuclear level and (2) integrating previously separate quality assurance/quality control (QA/QC) organizations into one centralized QA organization and program managed by the General Manager-NQA.

QA/QC activities at each site are under the direction of the site Quality Manager. The Manager-Quality Support is responsible for quality support of such activities as manuals and procedures, vendor audits and surveillance, QA/QC training, procurement controls, and oversight of the activities of the Nuclear Engineering

and Nuclear Support groups. Each of these three managers is responsible for identifying functional and programmatic deficiencies, tracking these deficiencies until they are fully resolved, and performing trend analyses.

The scope of NQA audits has been expanded to include comprehensive technical and performance-based audits in addition to audits of the adequacy and effectiveness of the QA program. Technical experts from outside the NQA organization are used, as necessary, to assist the experts in the NQA organization in the performance of these audits. NQA personnel will thus be able to focus on the adequacy and appropriateness of the technical activities of the various nuclear organizations. Trending and evaluation of the results of the independent QA/QC activities will highlight significant areas of concern for line management's attention. Periodic status reports on overdue closeouts on audit findings, together with quarterly trending reports, will be distributed to PECo's nuclear management to keep it informed of problem areas.

The Performance Assessment Section, responsible for assessing organizational performance and providing independent evaluations of the effectiveness of PECo's nuclear program, has been added to the NQA organization. These assessments and evaluations will be based on information such as plant performance trends, QA/QC reports, ISEG reports, trend analyses, direct observation of plant conditions and activities, internal evaluations similar to those performed by the Institute of Nuclear Power Operations (INPO), and special investigations and reviews.

The ISEG function also has been added to the NQA organization. The ISEG is responsible for performing independent reviews of plant operations, reviewing operating experiences that may indicate the need for improvements, recommending needed improvements, advising management on the overall quality and safety of operations, and maintaining independent oversight of the adequacy and timeliness of actions taken by line management in response to the Operating Experience Assessment Program (see Section 3.2.3 of this SER). The NQA organization is consistent with 10 CFR Part 50, Appendix B, and is an improvement because it reports at a sufficiently high level in the management chain so that it should be free of undue cost and schedule pressures and should be able to effect corrective actions for conditions adverse to quality. The integration of the separate QA/QC organizations into NQA should increase the visibility of NQA and enhance its functionability. Therefore, the NQA organization is acceptable to the staff.

3.2.2.1 General Manager-Nuclear Quality Assurance

The General Manager-NQA reports directly to the Executive Vice President-Nuclear. He is one of the six PECo members of the Nuclear Review Board (NRB). Reporting to him are the Assistant General Manager of NQA, the managers of the PBAPS and LGS Quality Divisions, the Manager of the ISEG, the Manager of Quality Support, and the Manager of the Performance Assessment Division.

Figure 6 in Section II of the restart plan shows the functional responsibilities of these managers. The reporting relationship of the General Manager-NQA and the functional responsibilities assigned to him are acceptable to the staff.

3.2.2.2 Shift Inspectors

As one of the steps to strengthen the site QA program, the licensee proposed to increase QC monitoring of shift activities. Recognizing that line management has primary responsibility for monitoring operating activities, the licensee discontinued continuous QA/QC monitoring of operating activities after the shift managers and their operating teams completed training and had demonstrated proficiency on shift.

The licensee has committed that QA/QC monitoring of operations will be conducted randomly so that all shifts and shift crews will be periodically monitored with the appropriate level of coverage determined by the General Manager-NQA and the site Quality Manager, depending on the level of shift activity and performance. This function is independent of the line organization, goes beyond the regulatory requirements of Appendix B, and is acceptable to the staff.

3.2.3 Operating Experience Assessment Program

The licensee has strengthened its Operating Experience Assessment Program (OEAP). The OEAP Manager, reporting to the Manager-Nuclear Support, is responsible for implementation of the program, including the following activities:

(1) receiving and screening information from both external sources (e.g., service information letters, significant event reports, significant operating experience reports, NRC information notices and bulletins, and significant event notifications) and internal sources (e.g., licensee event reports and ISEG event reports)

(2) forwarding appropriate information to involved line organizations and independent assessment groups

(3) consulting with involved line organizations to clarify, research, and evaluate the implications of information received; determine the need for new or corrective actions with respect to procedures, design, or practices; and determine lead responsibility for that action

(4) transmitting action requirements to the functional managers responsible for implementing the actions

(5) ensuring that copies of relevant information are received by the nuclear training, emergency planning, and other organizations that need this information

(6) maintaining the OEAP tracking program

(7) preparing monthly status reports, flagging overdue items and areas of concern

(8) annually assessing the effectiveness of the OEAP

The ISEG is responsible for maintaining independent oversight of the adequacy and timeliness of the actions taken by line managers in response to OEAP items.

Item I.C.5 of NUREG-0737, "Clarification of TMI Action Plan Requirements," provides guidance regarding procedures for feedback of operating experience to plant staff. PECo's OEAP is responsive to the NUREG-0737 guidance in this area and is, therefore, acceptable to the staff. Implementing procedures would be expected to provide more detail regarding OEAP functions.

3.2.4 Commitment Tracking Program

The licensee has developed a strengthened Commitment Tracking Program (CTP) to ensure integrated commitment tracking and effective, timely management of corrective action programs. Commitments made to NRC, INPO, and other organizations as well as those made by the licensee's NRB, ISEG, and NQA organization and under the OEAP will be tracked. Responsibility for implementing the CTP rests with the Licensing Manager in the corporate Nuclear Services group. As discussed in Sections 3.5 and 5.2 of Section I of the restart plan and in the licensee's letter dated July 22, 1988, line management is responsible for the making and completion of commitments. The Licensing Manager provides support to line management, which includes tracking the status of commitments and providing management reports on the status of each organization's commitments. The Superintendent-Technical has administrative responsibility for the CTP at the site.

The CTP will consolidate the past commitment tracking efforts of various licensee organizations. The program has been defined by the Executive Vice President-Nuclear, and an administrative procedure has been developed to implement the program as of July 1, 1988. The licensee cites the benefits of the CTP as establishment of a single point of line accountability, facilitation of commitment plan and schedule development, proactive management review of commitment activity, and facilitation of problem resolution at the lower management levels.

The staff concludes that the CTP is a useful tool for enhancing management processes in that it provides a systematic approach to commitment tracking, strengthens accountability, and will provide opportunities for management involvement up to the Executive Vice President-Nuclear in commitment management.

3.2.5 Nuclear Performance Management Program

The licensee has committed to establish a nuclear performance management program to achieve and maintain excellence. This program will include performance goals for excellence as well as technical and operational performance standards for each nuclear line organization. Performance indicators for tracking and reporting actual performance against the performance goals and standards will also be established. The Executive Vice President-Nuclear is responsible for having this program implemented throughout the nuclear organization by April 1989.

Measurement of performance against the established performance goals and standards will be tracked and reported to management. The timeliness and effectiveness of required corrective action at each management level will be monitored

and emphasized in the performance appraisal process. The NQA organization will assess the effectiveness of the program and report the results to the involved line management and the Executive Vice President-Nuclear.

Although not required by NRC and not required for implementation before restart, this program represents a good initiative by the licensee. The NRC will review its effectiveness during inspection activities.

3.2.6 Restart Readiness Self-Assessment

As noted above, the licensee has implemented programs to improve its self-assessment capabilities. The licensee's self-assessment of its readiness for restart will constitute an early test of these capabilities. The staff will evaluate the licensee's report in this regard and will report the results of its evaluation in conjunction with its own evaluation of readiness of the Peach Bottom plant for restart.

3.3 Company Management Oversight of Nuclear Operations

To meet this objective of strengthening the independent assessment process, the licensee has revised the Nuclear Review Board (NRB) charter and reporting relationship and has established a Nuclear Committee of the Board of Directors.

3.3.1 Nuclear Review Board

3.3.1.1 Membership

The NRB consists of nine members, six PECo personnel and three recently added outside consultants. The Peach Bottom Technical Specifications state that the qualification requirements for members of the NRB shall be an academic degree in an engineering or physical science field and a minimum of 5 years of technical experience, of which a minimum of 3 years shall be in one or more specified areas. The staff concludes that the incumbent members meet these qualifications.

3.3.1.2 Role and Relationships

The NRB is a group of individuals independent of plant operations charged with providing an independent review of safety-related activities. The specific responsibilities are described in the Peach Bottom Technical Specifications. The NRB reports directly to the Executive Vice President-Nuclear and submits copies of reports to the Chief Executive Officer of PECo. In addition, the Chairman of the NRB will meet directly with the Chairman of the Nuclear Committee of the Board and will report to this board at least annually.

The staff reviewed the provisions for the NRB and finds that they meet the guidance for independent review as described in Section 13.4 of the Standard Review Plan (NUREG-0800) and are acceptable.

3.3.2 Nuclear Committee of the Board of Directors

3.3.2.1 Membership

The membership of the Nuclear Committee of the Board of Directors (NCB) will consist of not more than four nonemployee directors from the PECo Board of Directors and one or more outside consultants to serve as advisors to the committee. The licensee has identified the consultants, and the staff considers them qualified to perform this function.

3.3.2.2 Role and Relationships

PECo has established the NCB as a standing committee of the Board of Directors. As such, it reports to the Board of Directors. Its role is to advise and assist the Board of Directors in its responsibilities for oversight of the company's nuclear operations. The NCB will receive information by directly meeting with the vice presidents of Peach Bottom and the Limerick Generating Station, other department managers, and the Chairman of the NRB and will receive information from and monitor the NRB, the Nuclear Quality Assurance Organization, and the Plant Operations Review Committee.

The staff reviewed the provisions for the NCB and concludes that the NCB, as an organizational group, goes beyond NRC regulatory requirements. The staff considers it a useful adjunct in keeping the PECo Board of Directors informed about the nuclear activities of PECo.

4 STATION MANAGEMENT LEADERSHIP

The licensee's analysis of the root cause of poor leadership by plant management, as discussed in Section II of the restart plan, follows:

> Leadership skills at PBAPS [Peach Bottom Atomic Power Station] were inadequate to develop employee understanding of and willingness to comply with high nuclear standards. Plant management's goals and performance expectations had not been communicated effectively to Peach Bottom employees; organizational and individual accountabilities had not been clearly established; and little effort had been made to establish a team approach to site work planning and implementation. In general, there were poor communications among site work groups, and between the station and off-site work groups. Much of the communication downward in the organization was handled by memos and there was a lack of open two-way communications between station management and employees. This lack of adequate leadership skills had resulted in poor morale in general. The operators, who were also feeling the results of the second root cause [failure to initiate timely licensed operator replacement training programs], had developed serious attitude problems evidenced by their lack of professionalism in the control room and by the hostility which they occasionally expressed toward other work groups, upper management, and visitors.

The licensee has developed the two corrective action objectives given below to address the lack of site leadership.

(1) establish a PBAPS management team with strong leadership and management skills

(2) increase the number of site management positions to ensure effective supervision and accountability for each function

The licensee proposed to identify individuals with strong leadership and management skills to staff each superintendent-level position and above to implement the first objective. The licensee stated it would conduct a search, internally or externally, as appropriate, to identify and select qualified candidates to staff positions at the superintendent level and above.

The licensee proposed to develop an organizational structure to provide increased management direction, control, authority and accountability for site work activities to implement the second objective. The licensee planned the following major activities to accomplish this task:

- identify work functions that should be removed from the responsibility of the plant manager to allow increased plant manager focus on day-to-day plant operations, while simultaneously providing additional dedicated management attention to areas such as outage management and station support

- establish a revised site organizational structure based on this analysis
- clarify and document functional accountabilities for each superintendent-level organization within the revised site organizational structure

The staff reviewed the qualifications and training of the Peach Bottom station management personnel against the staff guidance in Regulatory Guide (RG) 1.8, "Qualifications and Training of Personnel for Nuclear Power Plants" (Rev. 2, April 1987). This guide endorses ANSI/ANS-3.1-1981 or ANSI/ANS-N18.1-1971 for different personnel positions (see Regulatory Positions C.1 and C.2 in RG 1.8). The licensee has committed to ANSI N18.1-1971 except for the positions of senior health physicist and shift technical advisor.

4.1 Establishment of Management Team

To meet the first objective of establishing a management team with strong leadership and management skills, the licensee restructured the site organization.

4.1.1 Onsite Management Team

Figure 2.3 is a functional organization chart of the reorganized onsite management team with four positions reporting to the Vice President-PBAPS. The four positions are Plant Manager, Project Manager, Support Manager, and Training Superintendent. The staff reviewed the qualifications and training of PBAPS managers as given in Appendix B of the restart plan, with a special emphasis on the operations organization (see Section 4.1.2 of this SER), to ascertain that the qualification and experience of each meet the licensee's first objective to establish a Peach Bottom management team with strong leadership and management skills and satisfy the guidance of RG 1.8 and licensee commitments.

Vice President-Peach Bottom Atomic Power Station

On May 4, 1987, the licensee appointed Dickinson M. Smith, Rear Admiral, U.S. Navy (retired) as Manager-PBAPS. During his 25 years of Navy nuclear experience, Mr. Smith served as Chief of Staff, Allied Command Atlantic, where he directed an international military staff of 450 personnel. Previously he was Senior Military Commander in the Philippines, managing the largest U.S. Naval installation overseas with a total military and civilian work force of 35,000. Mr. Smith has introduced several major improvements in site management and organizational communications such as methodology for employees to report concerns, the "Tell it to the Manager" program, and regular meetings with personnel. After the corporate reorganization in October 1987, Mr. Smith assumed the responsibilities of the newly created position of Vice President-Peach Bottom Atomic Power Station.

On the basis of its review of Mr. Smith's qualifications, the staff concludes that he has sufficient leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for a manager.

Plant Manager

To staff the redefined position of Plant Manager-PBAPS, the licensee selected John F. Franz, who, as Manager-Limerick Generating Station (LGS), provided leadership to the management team that achieved high ratings in the NRC's systematic assessment of licensee performance (SALP) for Limerick. Mr. Franz has 25 years of experience, including a variety of supervisory positions at Peach Bottom before 1976, 9 years as Superintendent-Operations, LGS, and nearly 2 years as Plant Manager, LGS. He has held NRC senior reactor operator (SRO) licenses for Peach Bottom Units 1, 2, and 3 and LGS Unit 1.

On the basis of its review of Mr. Franz's qualifications, the staff concludes that he has sufficient leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for a plant manager.

Project Manager

The site Project Manager position has been filled by Kenneth P. Powers, who has over 20 years experience in engineering, craft supervision, quality control, cost engineering, and planning and scheduling, as well as Navy nuclear shipyard service. Thirteen years of his experience have been in the commercial nuclear industry, including seven years with Bechtel, where he was assigned for over four years as Project Field Engineer at LGS. There, he led an organization of 1,000 professional personnel through fuel loading and initial operations. Earlier in his career, while working for United Engineers and Constructors, he served as Project Engineering Manager at Seabrook Nuclear Power Station from pre-reactor pressure vessel hydrostatic testing through hot functional testing. He had demonstrated ability in planning, organizing, and leading complex organizations to achieve their stated goals.

On the basis of its review of Mr. Powers' qualifications, the staff concludes that he has leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for a technical manager.

Support Manager

David R. Meyers is the Support Manager at Peach Bottom. He has leadership skills gained during his 23 years of experience in PECo's Electric Production Department. Mr. Meyers has held supervisory and management positions since 1973. In 1974 he became Assistant Superintendent at PECo's Delaware Station where he served until accepting the position at Peach Bottom. He was Vice Chairman and Chairman of the Pennsylvania Electric Association's System Operation Committee in 1982-1983 and 1984-1985, respectively.

On the basis of its review of Mr. Meyers' qualifications, the staff concludes that he has leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for technical support personnel.

Training Superintendent

The licensee assigned Ernest A. Till as Training Superintendent. During 1985 and 1987, Mr. Till served as Nuclear Training Manager for Illinois Power Company, where he instituted major changes in the training department to ensure the success of general and INPO accredited training programs. Mr. Till has brought a wide range of professional experiences to his new position, including 33 years of service as a career Naval officer assigned to command positions in the nuclear field and 3 years as Director of the Mathematics and Science faculty at the U.S. Naval Academy in Annapolis, Maryland.

On the basis of its review of Mr. Till's qualifications, the staff concludes that he has sufficient leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for technical support personnel.

4.1.2 Operations Organization

The Operations organization consists of Superintendent-Operations, Assistant Superintendent-Operations, Operations Support Engineer, shift managers and the shift crew. The Superintendent-Operations reports to the Plant Manager who, in turn, reports to the Vice-President, PBAPS. Figure 4.1 is an organization chart for the Plant Manager. The following is an evaluation of the qualifications and experience background of the key management personnel at the site.

Superintendent-Operations

John B. Cotton was appointed Superintendent-Operations in November 1987 upon successful completion of his SRO examination for Peach Bottom. Mr. Cotton later received his SRO license at Peach Bottom. Before accepting this position, Mr. Cotton served as Superintendent-Plant Services, PBAPS. He has had 15 years of experience with PECo, including 6 years as Maintenance Engineer at LGS, where he was SRO-licensed. During his 5 years as a U.S. Naval officer, Mr. Cotton completed Navy nuclear power training and performed in a variety of supervisory roles.

Assistant Superintendent-Operations

Frederick W. Polaski, who has over 16 years of experience as an engineer with PECo, has been assigned by the licensee as Assistant Superintendent-Operations. He has held positions of increasing responsibility in nuclear operations since he joined PECo in 1972. Mr. Polaski assumed the duties of Operations Engineer at Peach Bottom in April 1987, following the shutdown. Before that assignment, he had served as Outage Planning Engineer for 4 years. Mr. Polaski holds an NRC SRO license at Peach Bottom.

On the basis of its review of the qualifications of Messrs. Cotton and Polaski, the staff concludes that they have sufficient leadership and management skills to meet the criteria of the first objective. Further, their education, experience, and training meet the staff guidance in RG 1.8 for an operations manager.

Operations Support Engineer

The Operations Support Engineer is Thomas M. Mitchell, who is on loan to PECo from the Institute of Nuclear Power Operations (INPO). At INPO, he served as Assistant Manager, and Manager of the Radiological Protection Department, and as Secretary of the Corporation and Staff Assistant to the President. He has 10 years of experience in nuclear engineering and certification as a health physicist (power reactors). He has a B.S. degree in nuclear engineering and an M.S. degree in mechanical engineering.

On the basis of its review of Mr. Mitchell's qualifications, the staff concludes that he has sufficient leadership and management skills to meet the criteria of the first objective. Further, his education, experience, and training meet the staff guidance in RG 1.8 for technical support personnel.

Shift Managers

The newly created positions of shift managers complete the operations management team. These positions have been filled by six licensed senior reactor operators.

They each hold a degree in engineering and have had 6 to 14 years of experience with PECo in a variety of technical and supervisory roles. Each of the shift managers has completed "Managing for Excellence," which is a 4-week intensive management training program specifically designed to enhance managerial skills for this new position. They have demonstrated their leadership ability by building shift teams that have a high degree of cohesion and proficiency, as demonstrated, to the satisfaction of NRC evaluators, by the performance of these teams during simulator training (see Section 6.2.2).

On the basis of its review of the qualifications of the six shift managers, the staff concludes that they have sufficient leadership and management skills to meet the criteria of the first objective. Further, their education, experience, and training meet the staff guidance in RG 1.8 for supervisors requiring NRC licenses.

4.1.3 Overall Evaluation of the Management Team

The licensee has assembled a sufficiently strong leadership team to provide new direction at Peach Bottom station. All five senior site managers (the Vice President, Plant Manager, Project Manager, Support Manager, and Training Superintendent) have demonstrated records of successful leadership and achievement across a broad spectrum of relevant backgrounds. Three of the five (the Vice President, Project Manager, and Training Superintendent) were hired from outside PECo and contribute new managerial perspectives from other organizational cultures.

The Operations organization at Peach Bottom has been similarly infused with management talent, as have other management positions in the expanded site organization. Of the top 16 PBAPS line managers at the superintendent level or above, 7 have been brought in from outside PECo, 2 have been transferred from LGS, 4 have been assigned from the corporate organization, and 3 have come from within the Peach Bottom organization. Collectively, these managers provide a

sufficiently strong leadership team with a balanced combination of new perspectives and adequately solid continuity and a common mandate to establish a proper site culture.

On the basis of its review of the qualifications of personnel, the staff concludes that the licensee has established a site management team with strong leadership and management skills. The team has the necessary managerial and technical resources to provide assistance to the plant staff for normal and emergency operation. The staff concludes that these staffing changes adequately address the objective to establish a Peach Bottom management team with strong leadership and management skills and, therefore, are acceptable. The staff further concludes that these personnel meet the guidance of RG 1.8 and the standards of ANSI N18.1-1971.

4.2 Supervision and Management Accountability

The licensee provided detailed information in Appendix E to Section II of the restart plan and a summary in Section 2.2.2 of the same document. The staff reviewed the information to determine if it met the second objective to increase the number of site management positions to ensure effective supervision and accountability for each function. The staff also reviewed the licensee's new operating organization and plant staffing plan against applicable portions of staff guidance in Sections 13.1.2 and 13.1.3 of the Standard Review Plan (NUREG-0800), with special emphasis on supervision and management accountability. The following is a summary description of the licensee's corrective actions and the staff's evaluation of those actions.

As part of the licensee's corporate analysis preceding the nuclear reorganization, the distribution of work within the corporate matrix organization in existence at that time was reviewed by the licensee to determine which work functions should be reassigned to the emerging nuclear organization. At the site level, each work function was analyzed to determine if it was a necessary part of the nuclear Plant Manager's responsibilities for day-to-day plant operations or if it could be reassigned to other site organizations responsible for support activities. This analysis resulted in the establishment of a nuclear-dedicated corporate organization and a revised site organization that provides more focused management direction and accountability for plant operations, outage planning and management, and other station support activities.

Table 4.1 provides a comparison of Plant Manager's staff and site management positions at Peach Bottom at the time of the shutdown order (March 1987) and after the reorganizations (April 1988).

In the new site organization, there are now 54 management positions at the senior engineer level or above (as compared with 23 such positions before the reorganization) to provide dedicated management attention to each site function and to ensure increased supervision of site personnel.

In addition to increased management accountability, there also is more employee accountability in the revised organization. All permanent and contract employees assigned on a regular basis to Peach Bottom work locations are accountable through their PECo or contract management reporting chains to the Vice

[illegible]esident-PBAPS, except for [illegible]e personnel involved in independent [illegible] and oversight activities. The reporting structure enables the Vice President-PBAPS to have full authority for planning, directing, coordinating, and controlling all site activities.

[illegible]ows the top management reporting structure and division of functional responsibilities for the site organization. Figure 4.1, which shows the [illegible], provides more information about the reporting structure, responsibilities, and assignments of the superintendent [illegible].

[illegible] organization are responsible for operating the station safely, efficiently, and in compliance with all applicable [illegible]. The revised definition of functional responsibilities [illegible] emphasizes the day-to-day operations of the station and eliminates the Plant Manager's former responsibilities for outage planning and management, modifications, personnel administration, security, and other [illegible] activities that have been assigned to the Project and Support organizations. The Plant Manager serves as PBAPS Emergency Director in accordance with the PBAPS Emergency Plan.

Previously, there were two superintendents reporting to the Manager-PBAPS; with the reorganization, there are now four superintendents.

- Superintendent-Operations is responsible for shift operations, including supervision of shift managers and shift technical advisors; for operations support, including blocking coordination; shift training; and administration.

- Superintendent-Maintenance/Instrumentation and Control (I&C) is responsible for developing and implementing preventive, predictive, and corrective maintenance programs for station mechanical, electrical, and I&C equipment.

- Superintendent-Plant Services is responsible for providing on-site plant chemistry, health physics, and radwaste management services in support of plant operations.

- Superintendent-Technical is responsible for providing plant technical support; reactor system and test engineering; fire protection; site coordination of the Licensee Event Report Program, the Commitment Tracking Program, and the Operating Experience Assessment Program; and site interfaces with Federal agencies, states, and industry.

The licensee's restart plan describes the structure and accountability of the new organizations under all four site managers (Plant Manager, Project Manager, Support Manager, and Training Superintendent). Although the staff performed a general review of these organizations, staff emphasis was directed toward the Plant Manager's organization, particularly the operations staff under the Superintendent-Operations.

Figure 4.2 shows the management structure for shift operations. The licensee established and filled the new position of Assistant Superintendent-Operations to assist the Superintendent-Operations in day-to-day shift operations management and administration and to ensure that one of these two senior operations managers is routinely available to operations personnel on shift.

The licensee established the position of shift manager (one for each of six shifts), reporting to the Assistant Superintendent-Operations, to provide a higher level of management authority on each shift so that the past problems of operators being isolated from management could be avoided. The shift managers serve as the Plant Manager's direct representatives on shift and have the authority to control shift operations. They coordinate and direct the activities of health physics, chemistry, maintenance, instrumentation and control, security, and construction personnel as well as vendor personnel and other site personnel during their shift as these activities relate to operating the plant. The shift managers directly supervise the shift supervisors and shift technical advisors (STAs).

The licensee established the position of the floor foreman who is responsible for coordinating and monitoring the activities of the non-licensed operators and overseeing such areas as watchstanding performance, attentiveness to duty, training, and overtime. The floor foreman reports to the shift supervisors.

The licensee established the position of Operations Support Engineer to head the new Operations Support organization. The Operations Support Engineer reports directly to the Assistant Superintendent-Operations. The Operations Support organization was developed to support the daytime shift organization by relieving operators and shift management of some of their administrative burden and ensuring coordination of all work associated with control room activities.

Reporting to the Operations Support Engineer is the Operations Support Superintendent, another new position. In addition to other support duties, this person is responsible for overseeing training and administrative matters for the shift supervisors.

The blocking coordinator reports to the Operations Support Superintendent. The new blocking coordinator position, available to licensed SROs on a rotational basis, was established to ensure the efficiency and safety of the blocking permit process. The blocking coordinator will supervise a group of licensed operators temporarily assigned to the processing of blocking permits for 2 to 3 months at a time. This arrangement will provide off-shift rotational opportunities to licensed SROs and ROs.

At the time of restart, each of the six shifts is to be staffed by a shift manager, two shift supervisors, three ROs, an STA, and a number of non-licensed operators. This shift complement reflects an increase of one additional shift supervisor beyond the requirements of the Technical Specifications and provides additional supervisory direction for shift operations activities and backup relief to the lead shift supervisor. One shift supervisor will remain in the control room; the other will be available to go where needed to observe, supervise, and direct activities throughout the rest of the plant.

A fourth licensed RO is to be added to the team as additional licensed-operator resources become available. Thus, each shift team will be augmented to provide greater flexibility for relief and rotation of operators and increased resources to handle unusual occurrences. The licensee believes that these changes, combined with an increased reserve of licensed operators, will be sufficient to ensure that any overtime will be managed effectively. The control of overtime is discussed in Section 6.4.2.5.

The licensee also changed the shift rotation schedule from reverse rotation to forward rotation. The schedule change was a result of licensee analysis performed by a task force of operators and management. The licensee management included operators in the task force to ensure that any change in shift policy would have a positive effect on morale. Early feedback from the operations staff indicates that the change in the shift rotation schedule has had a positive effect.

The new nuclear organization eliminates the company-wide matrix under which the licensee formerly provided engineering, maintenance, and construction support for its nuclear operations. The new site organization provides single-point accountability and control for site operations under the Vice President-PBAPS.

The licensee analyzed each site function to determine if it was a necessary part of the nuclear Plant Manager's responsibilities for day-to-day plant operations or if it could be reassigned to other site organizations responsible for support activities. This analysis resulted in a revised site organization (expanded from 23 to 54 management positions at the senior engineer level or above) that provides more focused direction and accountability for plant operations, outage planning and management, and other station support activities, including contractor activities.

The revised organizational structure also provides for a sufficiently strong corporate management presence on site, shortens and strengthens the nuclear operations chain of command, and strengthens interactive communications between members of the station organization and the management personnel of offsite support organizations.

The responsibilities and authorities of the personnel involved in the many disciplines required to safely operate a nuclear plant have been allocated among several upper-management positions to ensure more concentrated attention to those activities while establishing a direct line of accountability to the Vice President-PBAPS and ultimately to the Chief Operating Officer.

The revised site organizational structure will assist the Plant Manager in focusing his attention on safe and reliable operations by designating separate management and accountability authority for outage planning and site support activities, thus relieving the Plant Manager of these duties. The reassignment of outage planning and site support functions also will assist in focusing management attention in these areas.

A site-dedicated training function has been established to ensure more attention and responsiveness to site training needs, and the corporate Nuclear Training Division is intended to provide technical direction and support.

Sufficient changes have been made to the Peach Bottom Operations organization to provide additional managerial and supervisory focus on shift control room operations and floor activities. The addition of the shift manager position also addresses the past problem of the isolation of operators from management.

The new daytime Operations organization relieves operators of some of their administrative burden, while ensuring effective coordination of all administrative work associated with shift control room activities.

Additional reactor operator coverage on each shift, once more licensed personnel become available, will provide more flexibility for relief and rotational assignments and increased resources to handle any unusual occurrences on shift.

On the basis of its review of the information in the restart plan, the staff concludes that the licensee has sufficiently increased the number of site management positions to provide for effective supervision and accountability for each function and to meet the criteria of the second objective.

The staff further concludes that the licensee's operating organization is acceptable and meets the applicable requirements of 10 CFR 50.40(b) and 50.54(j) through (m). The licensee has described the assignment of plant operating responsibilities, the reporting chain up through the Chief Executive Officer of the company, the proposed size of the regular plant staff, the functions and responsibilities of each major plant staff organization, the proposed shift crew complement for two-unit operation, and the qualification requirements for members of its plant staff. The licensee also provided the resumes for its management and principal supervisory and technical personnel.

Therefore, the staff concludes that the licensee's new operating organization and plant staffing plans are acceptable.

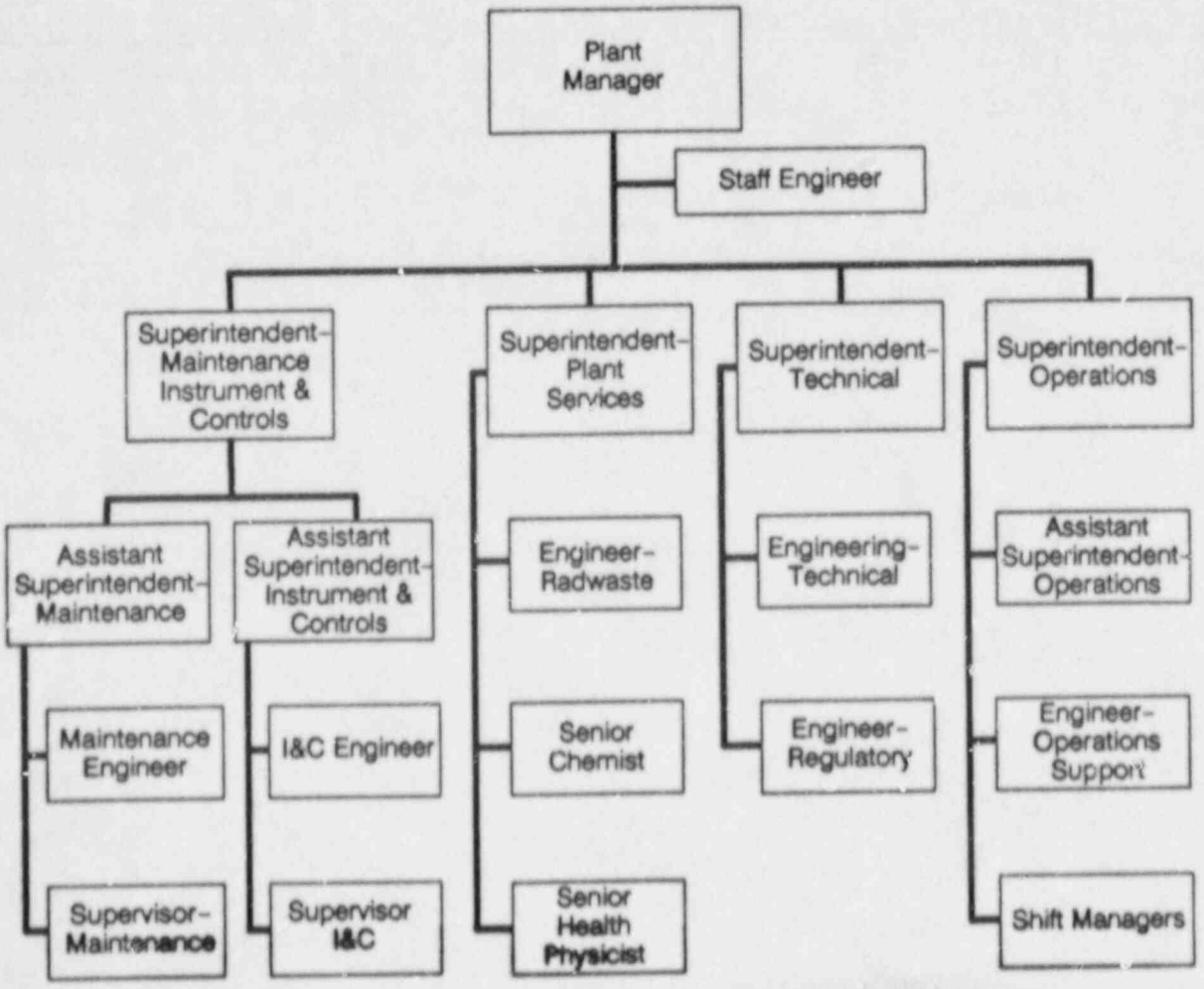


Figure 4.1 Plant Manager organization chart

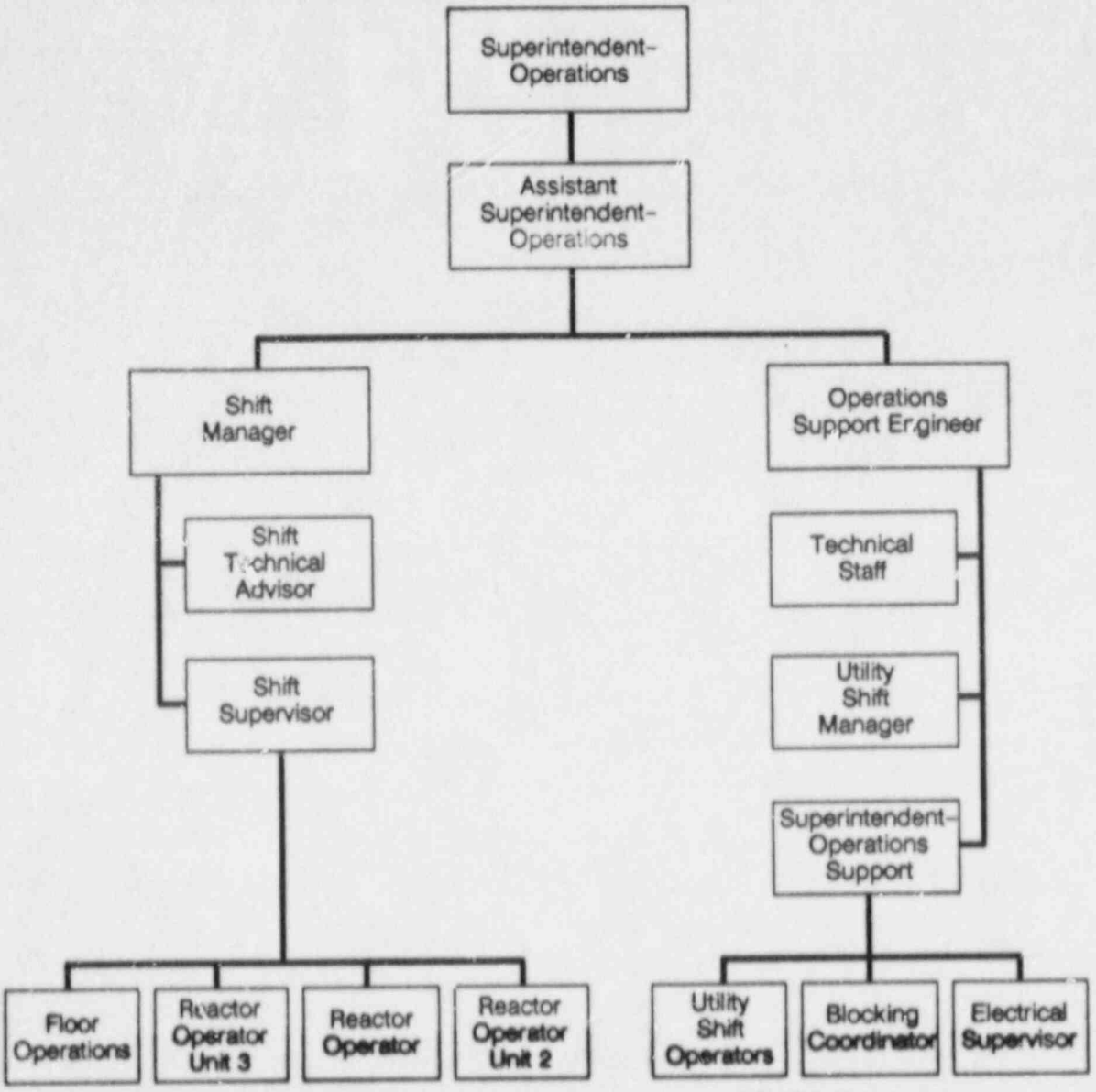


Figure 4.2 Shift operations management organization chart

Table 4.1 Plant Manager's staff and site management positions

March 1987		April 1987	
PBAPS Plant Manager's Staff[1]			
Plant Manager	1	Plant Manager	1
Superintendents	2	Superintendents	4
Staff engineer	1	Staff engineer	1
Senior engineers	8	Senior engineers	10
		Shift managers	6
Totals	12		22

PBAPS Site Management Positions[1]

Plant Manager's staff		Additional matrixed management[2]		PBAPS line management reporting through the nuclear organization[2]	
Manager	1	Superintendents	3	Vice President-PBAPS	1
Superintendents	2	Assistant superintendents or equivalents	3	Managers	4
Staff engineer	1	Senior engineers or equivalents	5	Superintendents	10
Senior engineers	8			Staff Engineer	1
				Assistant superintendents	6
				Senior engineers or equivalents	26
				Shift managers	6
Totals	12		11		54

[1] Management staff is defined as those positions included in the company's Management Salary Plan.
[2] Does not include site quality organization management staff.

5 LICENSED OPERATOR RESOURCE DEVELOPMENT

Chapter 3 of Section II of the restart plan addresses corrective action objectives, corrective actions, and associated major activities to eliminate or mitigate the root cause of the licensee's failure to initiate timely licensed operator replacement training programs.

The licensee's analysis of this root cause is as follows:

> There were not enough reserve licensed operator personnel or new replacements ready to take over as the existing work force transferred, retired, or resigned. Although shift coverage met safety requirements and Technical Specifications, there was an inadequate supply of licensed operator personnel to provide flexibility for relief or rotational assignments, handle the shift administrative workload effectively, or assure direct supervision of floor activity.
>
> Many licensed operator personnel were complaining about the negative impact on their family lives created by having to work extensive overtime. They were also seriously concerned about the lack of opportunities to pursue alternative career paths or to have some relief from shift work at some point in their career progression with the company.

To address this root cause, the licensee established the following corrective action objectives:

(1) Ensure an adequate reserve of licensed operators to provide flexibility for relief and rotational assignments and add additional supervisory and reactor operator coverage beyond the safety requirements on each shift. Specifically,

- ensure availability of sufficient numbers of qualified licensed operators to restart Peach Bottom station
- develop and initiate plans to create and maintain an adequate reserve of licensed personnel ready to fill temporary and permanent vacancies
- staff, on a rotating basis, a blocking and support group to reduce the administrative burden on the control room shift

(2) Ensure that shift personnel have opportunities to pursue alternate career paths and to have relief from shift work during their career progression at PECo. Specifically,

- develop additional career paths for shift personnel
- develop educational programs for operator personnel who wish to progress into technical and/or management positions

The staff analyzed the corrective actions proposed and/or implemented by the licensee. This analysis is presented in the sections that follow.

5.1 Current Resources

The following lists give the current licensed operator positions at Peach Bottom station and present staffing:

Senior Reactor Operator Licensed Personnel

- 1 superintendent-Operations
  Current schedule: in place

- 1 assistant superintendent-Operations
  Current schedule: in place

- 1 operations support engineer
  Current schedule: in place

- 6 shift managers
  Current schedule: in place

- 2 backup shift managers
  Current schedule: One with an inactive license is in place. One with a license that is restricted to operation during cold shutdown and refuel modes only.

- 12 shift supervisors
  Current schedule: in place

- 12 plant staff and/or licensed engineers
  Current schedule: 10 plant staff senior reactor operators with inactive licenses are in place.

Reactor Operator Licensed Personnel

- 24 operators
  Current schedule: 25 are in place: 14 are licensed to operate during all modes and 11 are restricted to operate during the shutdown and refueling modes only.

The licensee analyzed the number of licensed operators required for safe restart. Although the number currently available meets the requirements of the Technical Specifications, the licensee determined that augmenting the licensed operator staff with people from outside PECo would be beneficial in order to release additional Peach Bottom reactor operators for senior reactor operator training and to provide assistance with the processing of blocking permits.

The current staffing levels are sufficient to fill the Superintendent-Operations, the Assistant Superintendent-Operations, and the Operations Support Engineer positions. Current staffing levels also support the complement of six shift crews with each crew composed of one shift manager, two shift supervisors, and three reactor operators.

The licensee currently has 14 reactor operators with licenses applicable to all modes of operation and 11 reactor operators with licenses restricted to the cold shutdown and refueling modes of operation. There are 6 shift managers and 12 shift supervisors. The 11 reactor operators with licenses restricted to the cold shutdown and refueling modes of operation require additional training to have their licenses converted to allow operation in all modes. The staff will review the work hours of the operators and the effectiveness of training during the startup period.

The current staffing levels for licensed personnel described above satisfy the guidance of American National Standards Institute (ANSI) Standard N18.1-1971 as endorsed by Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants" (Rev 2, April 1987), 10 CFR 50.54(m), and the facility Technical Specifications for the startup and operation of a single unit. On the basis of its review, the staff concludes that the licensee satisfies the requirements for safe startup and operation of a single unit. Startup and operation of both units will be possible only after more operators holding unrestricted licenses are available.

5.2 Future Staffing Levels

The licensee has committed to establishing a staff of at least 42 active licensed members for two-unit operation. The breakdown of this goal is:

6 - shift managers (SRO)
12 - shift supervisors (SRO)
24 - reactor operators

As noted in Section 5.1, this goal is satisfied, except that 11 of the reactor operators have licenses restricted to the shutdown and refueling modes of operation.

The licensee also has committed to having licensed operators with either active or inactive licenses at the site. These additional licensed operators will be available in the future as staffing permits; the licensee projects them to be in place by 1991.

To ensure adequate reserves of licensed operators, the licensee has proposed corrective actions to (1) develop and initiate plans to create and maintain an adequate reserve of licensed personnel ready to fill temporary and permanent vacancies and (2) staff a blocking and support group, on a rotating basis, to reduce the administrative burden on the control room shift. The major activities associated with these corrective actions are listed below.

- develop higher entry standards and appropriate compensation schedules for the recruitment and hiring of future candidates for licensed operator positions
- develop and initiate a plan for additional operator training programs to provide an ongoing reserve of licensed operators
- accelerate the operator training program to increase the number of available licensed operators more quickly

- develop a plan to identify and train qualified personnel to staff a blocking and support group

- clarify and document the responsibilities of the work control group

The licensee has taken several actions to accelerate the recruitment and training of candidates for licensed operator training. These actions include:

(1) Existing personnel policies and compensation practices related to the hiring of new employees were reviewed to determine what changes were needed to permit nuclear personnel to be hired more promptly and at other than entry levels. Following the review, both the written policy and compensation practices were appropriately changed.

(2) In July 1987, higher standards of screening for candidates for the licensed operator progression were adopted to include a minimum of 2 years of post-high-school technical education, U.S. Navy nuclear training, or equivalent education and work experience. Successful candidates are paid more money at the starting level. The hiring procedures have been revised to include three new provisions: (a) a review by the site vice presidents is conducted to establish budgeted positions critical to the operation at each nuclear plant; (b) an "open posting" is maintained for these critical positions so that the licensee's ability to expand forces and/or replace losses will be maximized; and (c) any requisitions for employment in these critical areas are expedited by simultaneous processing of potential candidates for transfer from within the company and newly hired people from outside the company.

(3) The licensee's Personnel and Industrial Relations organization was requested to recruit and hire additional licensed operator candidates in accordance with these revised requirements. Fifteen employees (14 newly hired people with Navy nuclear experience and 1 internal PECo transfer) were recruited in the summer of 1987 and successfully passed a plant operator screening test. They are completing qualification as auxiliary operators at Peach Bottom. The licensee also is hiring 20 additional employees in 1988 to enter training as helpers.

(4) An accelerated license training program for experienced Peach Bottom plant operators started in August 1987. This led to the licensing of additional operators who are restricted to operation in the shutdown and refueling modes in the summer of 1988. A continuing series of licensed operator training classes will be conducted to fill new licensed operator positions, maintain an adequate reserve of licensed personnel ready to fill temporary and permanent vacancies, provide career path opportunities, and manage overtime of operators effectively.

(5) For the short term, the licensee had a team of three Hope Creek licensed personnel, provided by Public Service Electric and Gas Co., to assist in processing blocking permits which had previously consumed significant amounts of time and attention of control room operators. The operators on loan from Hope Creek did not perform licensed duties and were released when additional licensed operators were available to work at Peach Bottom.

(6) An adequately staffed training department is needed to support initial training of operators and continuing requalification training. The licensee recognizes that effective and timely training of all nuclear personnel is a critical element in improving self-assessment and problem-resolution capability within the nuclear line organizations. A corporate training organization reporting to the Vice President-Nuclear Services has been established.

The onsite training organization has been established as a superintendent-level position reporting directly to the Vice President-Peach Bottom. The Training Superintendent will also work with the corporate training organization.

The licensee's plans for recruitment, hiring, training, and licensing of operators represent a commitment to establishing a large body of trained and trainable operators. The plans allow for increased hiring flexibility with higher initial standards for entry at a higher starting wage. These plans should increase the licensee's ability to recruit qualified employees. To evaluate the aptitude of the applicants, the licensee administers a new-employee screening test. Additionally, a candidate who is enrolled in a licensed operator training program is screened during this program to verify that he/she is ready for licensing. This screening is intended to ensure that candidates for license application are adequately qualified.

On the basis of its review, the staff concludes that the licensee's plans to increase its licensed operator staff are appropriate because of revised recruitment practices, accelerated training programs, management restructuring of the training organization, and management commitment to the goal of increased staffing.

5.3 Offshift Rotation and Alternative Career Path

The licensee has proposed corrective actions to develop (1) additional career paths for shift personnel and (2) educational programs for operator personnel who wish to progress into technical or management positions. The major activities to support these corrective actions are listed below.

- develop additional career path and rotational offshift assignment opportunities within the shift job progression for non-degreed personnel.
- develop additional opportunities for lateral transfers and/or promotions for shift personnel into other functional areas where additional operating experience would be beneficial
- research available options and recommend a program leading to a bachelor's degree in engineering for licensed operators
- research available options and recommend a program leading to a certificate in nuclear science for operator personnel

To implement some of the corrective actions and major activities, the licensee has established additional career path opportunities for licensed and non-licensed operator personnel by the new structure of the Operations organization described in Chapter 2 of Section II of the restart plan. The new position of

operations support superintendent establishes an additional career progression opportunity for licensed personnel beyond operating shift assignments. The new position of blocking coordinator provides licensed operators with an additional offshift assignment possibility. The shift managers will also rotate to and from other management positions every 3 to 5 years to increase their understanding of other organizations.

As more licensed operators become available for shift assignments, the licensee plans to open other career path opportunities for licensed operators who choose to accept offshift assignments in training, quality assurance, outage planning, and other site and corporate support functions that would benefit from the addition of more staff with operating experience.

The licensee has stated its commitment to support the career advancement of licensed operator personnel into positions requiring college degrees. A special program at a local university is being investigated for licensed operators who wish to earn a bachelor's degree in engineering. The licensee intends to provide support in terms of tuition and paid leave for selected personnel who wish to pursue this educational opportunity. The licensee is also investigating a continuing education alternative with the University of Maryland off-campus program in nuclear operations technology. Both programs will offer licensed operators the opportunity to progress into plant and corporate management or professional assignments, including the position of shift manager.

The current plans for offshift rotation and career advancement depend greatly on the continuing development of available licensed personnel to take their places on the crews. The licensee's plans to develop licensed personnel are adequate to satisfy these goals; however, attrition of licensed personnel and failure by candidates in training to become licensed will directly affect these goals.

On the basis of its review, the staff concludes that these actions are sufficient to meet the objectives of providing opportunities for offshift rotation and career advancement paths for licensed personnel.

5.4 Overall Conclusions

On the basis of its review, the staff concludes that the licensee satisfies current requirements for shift staffing per 10 CFR 50.54 and the facility Technical Specifications for the startup and operation of one unit. Also, the licensee's plans for resource development are adequate to increase the number of licensed operators to allow two-unit operation.

6 CULTURAL CHANGE

Chapter 4 (Section 4.2) and Chapter 5 (Section 5.3) of Section II of the plan for restart address the root cause stated as "the station culture, which had its roots in fossil and pre-TMI [Three Mile Island] operations, had not adapted to changing nuclear requirements." In evaluating the licensee's responses to this issue, the staff has used the knowledge gained from the extensive body of theoretical and applied research in the fields of management and organization development. The staff also has relied on its experience in assessing utility management as part of the licensing function of the NRC.

To address this root cause, the licensee has established the following four corrective action objectives:

(1) identify and communicate the cultural values which PECo and PBAPs management are committed to supporting in the pursuit of nuclear excellence

(2) provide training and team building support for management to live by these values

(3) provide training and communication processes which support employee commitment to these values

(4) ensure that management policies, programs and control systems support these cultural values

Section I of the plan for restart (Sections 3.8 and 5.2) addresses aspects of corporate management's failure to recognize the developing severity of the problems at Peach Bottom; thus, not taking sufficient corrective actions. The licensee has proposed to develop the management systems and managerial skills that will strengthen self-assessment and problem-resolution capabilities within the nuclear organization as one of its objectives to correct this problem.

The corrective actions being performed or planned to meet each of the specific corrective action objectives are evaluated in the sections that follow.

6.1 Identification and Communication of Cultural Values

The licensee's management states in its restart plan that it is building nuclear cultural values on the themes of:

- individual accountability for performance
- individual responsibility for safety and assurance of quality
- teamwork
- open and candid communications
- striving for excellence in all aspects of nuclear operational and organizational performance

To support these themes, licensee management has developed a variety of written communications as described in Sections 4.2.1 and 5.3.1 of Section II of the restart plan. These communications include

- the nuclear group vision, mission statement, and objectives
- plant objectives and goals to support nuclear group objectives
- nuclear group management philosophy for assurance of quality

A variety of methods have been used to impart the contents of these communications to all employees: the written communications have been published in company newspapers, they have been discussed at meetings, they have been included in general employee training, and they have been posted on bulletin boards.

In addition, Section 2.3 of Section I of the restart plan indicated that the Manager-Organization and Management Development Division will assist the nuclear management team to establish and implement specific objectives for change in terms of management and work behaviors (i.e., cultural change) and to monitor progress toward meeting those objectives. In supplementary communications, the licensee provided additional information on the process to be used to ensure the assimilation of the nuclear group's vision, mission, and values throughout the organization. Behaviors identified as indicative of the nuclear group's vision, mission, and values will provide the basis for ensuring their assimilation. This process will be initiated in early 1989. Another program to support cultural change is the program, "Managing Organizational Change" (MOC) implemented across the entire nuclear group and whose objective is to develop implementation strategies for moving the organization toward its desired cultural values.

The staff finds that the cultural values as described in the plan for restart and in supplementary information have been identified and communicated.

6.2 Management Training and Team Building for Cultural Change

6.2.1 Managing for Excellence Evaluation

The staff's review of Section I of the restart plan (Sections 3.8 and 5.2) and Section II of the restart plan (Sections 4.2.2 and 5.3.2) indicates that the licensee has initiated a number of activities related to management training and management team building. The training activities include formal training (e.g., the "Managing for Excellence" (MFE) course), individual coaching/consulting by organizational development personnel, training in working with personnel management policies and managing meetings, and management modeling and visits to well-managed plants. In supplementary communications, the licensee provided additional information and a syllabus of the manager/supervisor training program that will proceed from the MFE course and will focus on improving organizational performance. Other training activities will be developed after the results of a training needs assessment survey have been considered.

The team-building activities include formal training, for example, the MFE course, the simulator team training, and the "Personal Effectiveness" (PE) course for non-operations department first- and second-line supervisors; intergroup meetings; a variety of site management meetings to discuss program development, progress, plans, and priorities.

On the corporate level, the licensee established [illegible]zation and Management Development Division; this division has two sections: (1) Organization Development and (2) Management and Professional Development. This division is responsible for providing processes by which nuclear managers can identify blocks to goal achievement, develop strategies to move from the present state to the desired state and monitor the progress of the transition, and also to assist managers with monitoring and assessing the "people management" aspects of organization performance. A key element in this process is helping nuclear managers to specify the changes desired in terms of management and employee work behaviors and communications and to routinely assess progress toward achieving the desired organizational values, performance, and culture. This division is also responsible for developing the management potential of technically competent individuals who currently do not fill management roles and to assess managerial skills and abilities of present managers and upgrade their knowledge, skills, and competencies through a variety of training activities.

In addition to evaluating the plan for restart, the staff observed the MFE course and simulator team training course and interviewed several shift managers. The staff found, as stated in Inspection Report 50-277/278-88-10, that the training programs were effective in building basic managerial skills, interpersonal communication skills, and team work skills. Furthermore, interviews with the shift managers confirmed earlier staff observations of the MFE course that the shift managers appear to be thoroughly committed to their new roles and to creating a healthy operational environment by promoting safety, quality, and scheduled in that order of priority.

The staff finds that the actions undertaken or proposed in the plan for restart are acceptable and should respond to staff concerns cited in Inspection Report 50-277/278-88-10 about the need for managers to reinforce the new behaviors, support improved communications, and promote understanding of personnel, management, discipline, and administrative policies. However, the NRC staff will periodically monitor the training programs to determine whether they continue to be effective and whether management will continue to reinforce the new culture.

6.2.2 Shift Team Evaluations

As a component of initiating a cultural change in the operations staff, the licensee formed new operating crews under the leadership of the shift managers. These crews were given training on a team basis to integrate the benefits of previous training in communications, attitude skills, and management into shift operations.

The NRC assessed all operating shift crews and the shift managers to measure the following eight areas:

(1) overall crew interaction
(2) knowledge and use of Peach Bottom procedures
(3) knowledge and use of Technical Specifications
(4) crew communications
(5) operator responsibility

(6) supervisory ability
(7) shift managers' abilities to supervise and lead the operating crews
(8) shift managers' implementation of the emergency plan

This assessment was performed to evaluate how effectively the shift manager and operating crews had been trained in the above areas to ensure that the operating crews performed acceptably for the safe restart of the Peach Bottom reactors.

The staff reviewed the fidelity of and the similarity of the Limerick simulator to the controls at Peach Bottom; and, on the basis of this review, the staff determined that the Limerick simulator was suitable for assessment of the Peach Bottom operating crews, if the assessment areas would be limited to those described above.

The training staff at Peach Bottom provided the NRC staff with copies of the simulator training scenarios and an evaluation of how compatible these scenarios were for use on the Limerick simulator. Information also was provided on the cause and effect of simulator malfunctions. The NRC used the simulator training scenarios and other information to develop scenarios for the crew evaluations. A typical scenario contained at least one of each of the following events: a normal evolution, a component failure not expected to cause a scram, an instrument or controller failure not expected to cause a scram, and a major failure causing a transient.

The training staff at Peach Bottom provided the NRC with its team training learning objectives, its evaluation checklist, the administrative procedures that define the conduct of operations, and position descriptions for the shift manager and the other members of the operating crew. From the information provided, NRC operator licensing examiner experience, and other sources, the staff developed performance standards for making the assessments.

Each operating crew was evaluated, in real time, during its performance of two simulator scenarios that the NRC staff had prepared.

At the completion of the assessments in January 1988, the staff found that all shift operating crews satisfied the performance standards in all areas assessed.

The shift managers were effective in their roles as crew supervisors and leaders. They called the operators' attention to plant conditions, when appropriate; conducted shift briefings on existing conditions and planned actions; correctly implemented the emergency plan, when warranted; and coordinated support from other organizations, as necessary. The performance standards, the assessments and their results are documented in Inspection Report 50-277/278-87-35.

Subsequent NRC evaluations of the shift operating crews were performed during August and September 1988 at the Peach Bottom simulator. During these evaluations, some performance deficiencies were found in the use of the plant transient response procedures, performance of surveillance procedures, and in the implementation of the emergency plan. The licensee has committed to additional training to correct these deficiencies. The staff will perform additional assessments to determine the effectiveness of this training. The results of the additional assessments will be needed to make a final assessment of readiness for restart.

6.3 Employee Training and Communications for Cultural Change

The staff's review of Section II of the restart plan (Sections 4.2.3 and 5.3.3) indicates that the licensee has undertaken a wide variety of activities related to employee training and communications to effect cultural change. The major activities include a 6-week attitude assessment and training program for licensed operators - the course, "People - The Foundation of Excellence" (PFE); an 8-day shift team training at the simulator; a 2-week attitude training program for non-licensed operators - the course, "Personal Effectiveness" (PE); an employee/management communication program, "Tell It to the Vice-President;" an employee involvement program (referred to as PB-Team); an organizational survey - the "Productivity/Quality Profile" and feedback process; all-employee meetings; and an emphasis on management by walking around (MBWA).

In addition to evaluating the plan for restart, the NRC staff observed parts of the PFE and the simulator team training courses and interviewed several operators who had completed this training, as well as individuals responsible for developing the training programs and individuals responsible for selecting the operators who would participate in the program. The staff's evaluations, based on these observations and interviews, are given in Inspection Report 50-277/278-88-10. The staff determined that the training programs were effective in providing operators with personal insights, interpersonal skills, and effective team work and communication skills. In addition, the interviews confirmed that operators apparently understood the consequences of inattentiveness to duty and its effect on plant safety and, furthermore, understood their obligations to their individual license to actively monitor plant conditions, etc.

To support the knowledge and insight gained from the formal training course, the licensee has developed a followup training program entitled "Interaction" that will include appropriate elements of the PFE and MFE courses. In addition, progression training for operators will include appropriate elements of the PFE and MFE courses. Analysis and review of the knowledge and interpersonal skills and abilities needed at each level of progression will help determine which elements of the formal training course should be included in the progression training. The process will accommodate new and transferred operators entering the progression cycles. The analysis and review will begin in the fourth quarter of 1988; a target period to begin phased-in implementation of the appropriate curriculum elements for each level in the progression is the second quarter of 1989. This process will ensure proper coverage of interpersonal skills training for all current and future operators. To support the phased-in implementation of interpersonal and professional effectiveness training in the progression, continuing, and requalification training cycles, non-supervisory plant personnel outside the operations chain will participate in a program similar to the followup training. This program will add to the framework, language and skills in support of cultural change. The licensee intends to begin implementing this training in the second quarter of 1989

On the basis of its review of the plan for restart and on its observations and interviews, the staff finds that many of the activities undertaken to support employee training and communications for cultural change have been appropriate. Furthermore, the licensee's actions to follow up on the initial training programs and to include elements of such programs in progression training should help to ensure that the requisite cultural changes will occur. Because the training programs and communications activities are significant actions developed in direct response to the issues raised in the shutdown order, the NRC staff will monitor activities over a period of time to determine that these activities have produced positive results.

6.4 Human Resource Practices, Policies, and Programs of Management

6.4.1 Personnel Evaluations

In Section II of the restart plan (Section 5.3.4), the training course for managers and supervisors is outlined; the course will provide instruction on all phases of performance appraisal, including writing performance standards and effective performance evaluations, effective praise and reprimand, and practice in writing and presenting clear goals. In supplementary information, the licensee has stated that, before restart, managers and supervisors will be trained on how to conduct face-to-face performance appraisals. The training, which was developed by staff of the Management and Professional Development Section, is being conducted by outside consultants. The NRC staff finds the licensee's response acceptable.

The licensee also has stated that all employees at Peach Bottom will discuss their performance face to face with their immediate supervisors. In the discussions, performance standards will be established for each employee. In addition to reviewing employee performance annually, as is required, the plant manager will review performance face to face at nominal 6-month intervals with each employee reporting directly to him; the plant manager will provide more frequent opportunities for reviewing the performance of management staff and for taking corrective actions required in a timely manner. Management personnel have been instructed to discuss performance with their employees as often as needed. In supplementary information, the licensee has provided a copy of a written message from the site Vice President that was sent to all employees to assist them in understanding their role in the performance appraisal process. The message emphasizes how important it is that employees understand the purpose of performance appraisals, the value of an employee preparing for appraisals, the employee's contribution to the appraisal, and the employee's understanding of what is expected in the future. The staff finds that the licensee's activities in the area of strengthening its performance appraisal system are acceptable.

6.4.2 Disciplinary Policy

In Section II of the restart plan (Section 5.3.2), the licensee has committed to revise disciplinary policy to ensure that its management will be provided with the appropriate authority to require employee performance standards consistent with nuclear requirements. The licensee has stated that training on these revised disciplinary policies and work rules will be completed for the plant manager through shift-manager levels before Peach Bottom restarts. This

training was developed by the Director of Management and Professional Development of the nuclear group and by the personnel administrator at Peach Bottom. The personnel administrator will conduct the training. The staff finds this response acceptable.

The licensee also has stated that the new disciplinary guidelines and procedures will be issued to all employees in the handbook, "You and Your Company." The handbook is being revised and will be reissued to all employees.

The handbook is being revised and will be reissued to all employees. Supplementary information provided by the licensee states that when the revised handbook is distributed, employees will be required to sign a statement that they have received the handbook. In addition to the handbook, all employees have been given copies of the revised disciplinary guidelines and grievance procedures. The licensee has provided a copy of the memorandum from the Vice-President, PBAPS, to the senior staff that transmits these guidelines and procedures. The memorandum directs the senior staff to (1) provide all personnel with the material, (2) ensure that employees are familiar with the grievance procedures, and (3) direct any questions on the policies to the PBAPS Personnel Administrator. In this supplementary information, the licensee has also committed to keeping track of the employees' questions directed to the plant personnel administrator for a period of 90 days following the distribution to assess the employees' understanding of the procedures and guidelines and determine the need for document revision. The staff finds that these are acceptable measures for ensuring that disciplinary policy is disseminated among Peach Bottom employees.

The licensee also has described the tracking procedure that has been developed to ensure that each step in the grievance process has been performed and the generic schedule to ensure timely resolution of grievances. The handbook, "You and Your Company," also instructs employees to direct questions or concerns regarding grievances to their immediate supervisors. The revised nuclear group grievance procedures require first-level supervisors to respond to employee concerns within 20 days. If this time period is not met or if the employee finds the response unsatisfactory, the employee can present the concern to successively higher levels of supervisors up to and including the department head; for example, for operations, this would be the Vice President-Peach Bottom Atomic Power Station. Each level is required to respond in a timely manner, not to exceed 20 days. The employee is responsible for keeping track of the grievance up to this point. If the employee's concern is still not resolved, the employee can present a formal grievance to the licensee's Personnel and Industrial Relations Department. The Manager of Industrial Relations tracks each grievance submitted to the Personnel and Industrial Relations Department by maintaining a file that indicates its status. This file is periodically reviewed by the licensee's Manager of Industrial Relations to ensure timely resolution of grievances.

The licensee also has stated that a consultant has been retained to review the licensee's industrial relations protocols. This effort is expected to be completed in November 1988. The comprehensive review will result in a revised set of protocols that will form the basis for discipline and grievance-handling procedures for the plant. Managers and supervisors will be trained in 1989, after the protocols have been developed. The licensee has made a commitment to

provide the results of the review before restart. This process and its tracking system should be followed over time by the licensee to ensure its continued implementation.

6.4.3 Career Paths

The licensee discussed a number of long- and short-term program activities for management and professional development in Section II of the restart plan (Section 3.8.2). Planned off-shift rotations were part of the licensee's review of its career path program for operators. The licensee stated that operations personnel going on rotation will be assigned to positions where their operations experience will add to the organization's capabilities. This job rotation is designed to increase the experience level of the entire PECo nuclear group. In a similar light, shift managers will rotate approximately every 4 years, bringing their control room experience and supervisory training to other parts of the organization. The licensee states that this will help other work groups understand operations requirements, increasing the ability of shift managers to work well with operations personnel and support operations activities.

The staff finds these mechanisms constitute acceptable means for providing both operations and managerial personnel with the tools to pursue career paths throughout the Peach Bottom organization.

The licensee also has provided the training syllabus for the 27-day course, "People - The Foundation of Excellence" (PFE), which was given to the currently licensed operators and shift technical advisors at Peach Bottom. The course is divided into four units of study that incorporate fundamental core elements of supervisory and leadership training. The course begins with training in personal insight and interpersonal skills and builds up to, and concludes with, group dynamics and conflict management. The licensee states that these awareness skills constitute the basic building blocks of supervisory behavior and leadership skills required for executing licensed operator responsibilities and, ultimately, shift supervisor responsibilities.

The staff has reviewed this syllabus and has observed the training in progress at Peach Bottom during its interim and final inspections of the rehabilitation program. The staff has concluded that this training provides interpersonal and self-awareness skills that would prove of value to operators, both in their current positions and in career paths they may pursue throughout the organization.

In its restart plan, the licensee has also identified a number of short-term and long-term plans for career development that include assessments of managerial skills and abilities, development of technical personnel for promotion to supervisory and management positions, an improved nuclear performance appraisal program, and the establishment of individual development plans.

The staff finds these methods for developing career paths acceptable. However, the staff expects to review the mechanisms both in its inspections before restart and over a longer period of time to ensure the licensee continues to implement them.

6.4.4 Shift Rotation

In Section II of the restart plan (Section 2.2.2), the licensee states that the shift rotation schedule has been switched from a reverse or backward rotation to a forward rotation. This change was made as the result of an analysis by a task force of operators and management and was facilitated by Circadian Technology, Inc. This consultant also had a role in the PFE training course for operators. During the staff's interviews with operators as part of the interim and final inspections of the rehabilitation program, operators stated that they were generally satisfied with the change in the direction of the shift rotation and reported that they felt less fatigued. A number of those interviewed indicated that they learned several coping mechanisms for dealing with the fatigue inherent in shift work.

The staff finds forward rotation an acceptable mechanism for reducing the fatigue associated with shift rotation. This type of rotation has been extensively researched by a number of specialists in circadian rhythm technology and has generally been found to be less fatiguing over long periods.

6.4.5 Control of Overtime

Section II of the restart plan (Section 2.2.2) and supplementary information provided by the licensee state that the licensee has as its goal to minimize the use of overtime through a number of initiatives that are currently in progress. These initiatives are as follows:

(1) The licensee plans to staff the Peach Bottom operations groups with seven licensed operators on a six-shift rotation basis. This exceeds the shift staffing required by the licensee's Technical Specifications, which is two SROs and three ROs.

(2) The licensee has made a long-term commitment to increase the number of licensed operators at Peach Bottom.

(3) Staffing and work assignments for plant personnel will provide adequate coverage so that routine use of overtime becomes unnecessary. The objective will be to have shift operations personnel work an 8-hour day, 40-hour week while the plant is operating. However, overtime work may be required on a temporary basis during periods of extended shutdown for refueling or during periods when major modification or maintenance is taking place.

(4) The licensee submitted a proposed revision to the Peach Bottom Technical Specifications on September 7, 1988, designed to ensure control of the overtime worked by ROs and SROs. The licensee has stated that the proposed revision is incorporating the guidance in the NRC's current recommendations on the overtime issue as contained in its proposed updated policy statement. The licensee also has stated that the increase in staffing, basic changes in work distribution philosophies, performing maintenance on all three shifts rather than on day shift only, and scheduling routine maintenance throughout the year instead of waiting

until outages to perform such tasks should eliminate the need for excessive overtime. The blocking work group is also tasked with reducing the overtime demands on operators.

The staff finds these methods acceptable for reducing unnecessary and excessive overtime. However, the staff will review the licensee's proposed revision to its Technical Specifications to ensure that appropriate controls are established.

7 CONCLUSION

In Sections 3, 4, 5, and 6 of this SER, the staff evaluated the licensee actions to correct the four root causes of the conditions that led to the issuance of the NRC order of March 31, 1987, requiring that the Peach Bottom facility be shut down. The staff concluded that the root causes identified by the licensee, listed below, adequately characterize the problems leading to the order.

(1) Failure of the Corporate Organization To Identify and Correct the Problems at Peach Bottom: The licensee has restructured the organization to focus management involvement on nuclear operations, put in place new key senior executives with demonstrated success in managing similar organizations, and strengthened its self-assessment and independent assessment capabilities. The staff concludes that these measures appropriately address the root cause.

(2) Inadequate Leadership at the Peach Bottom Site: The licensee has a new site management team from both inside and outside the licensee organization with strong leadership and management skills and has restructured the site organization to provide effective supervision and ensure accountability for all functions. The staff concludes that these measures are acceptable to address the root cause.

(3) Failure To Initiate a Timely Licensed Operator Replacement Training Program: The licensee has raised the entry-level standards and starting salary to ensure a sufficient number of qualified applicants for licenses and has provided for short-term and long-term rotational and developmental positions for licensed operators. More operators have been licensed since the order was issued than the number with licenses that had expired. The staff concludes that the licensee's plan to develop adequate licensed operator resources is acceptable. In addition, when training activities are completed for a sufficient number of the operators currently holding restricted licenses, then the licensee will have a sufficient number of operators to operate the second unit.

(4) A Station Culture That Had Not Adapted to Post-TMI Changing Nuclear Requirements: The licensee has identified and communicated new cultural values; has provided licensed operator and management training and fostered team building to support these values; and has developed management policies, programs, and control systems to support these values. The staff concludes that licensee actions to improve the culture are appropriate to address the root cause.

On the basis of its review and evaluation, the staff concludes that the revised plan for the restart of Peach Bottom Atomic Power Station submitted on April 8, 1988, as clarified by supplemental information listed in Appendix B, meets Requirement V.C. of the March 31, 1987 Order Suspending Power Operations and Order To Show Cause that the licensee submit a detailed and comprehensive plan and schedule to ensure that the facility will be operated safely and comply

with all requirements including station procedures. The NRC staff will continue to monitor the effectiveness of the implementation of this plan by the licensee. For example, the NRC staff will conduct an integrated assessment team inspection after the licensee has certified to the NRC the readiness of the Peach Bottom facility for restart based on a self-assessment and a scheduled evaluation by the Institute of Nuclear Power Operations.

APPENDIX A

CHRONOLOGY

June 12, 1986, letter, V. Stello, NRC, to J. L. Everett, III, PECo, regarding NRC assessment at Peach Bottom Atomic Power Station.

March 31, 1987, V. Stello, NRC, to PECo, Order Suspending Power Operation and Order to Show Cause.

April 6, 1987, J. S. Kemper, PECo, to T. E. Murley, NRC, Subject: Order Suspending Power Operation, Peach Bottom Atomic Power Station Units 2 and 3.

April 20, 1987, J. L. Everett, PECo, to V. Stello, NRC, regarding the order to show cause issued March 31, 1987.

August 7, 1987, letter, J. H. Austin, PECo to W. T. Russell, NRC, transmitting the "Commitment to Excellence Action Plan."

August 24, 1987, letter, W. T. Russell, NRC, to J. H. Austin, PECo, requesting additional information to CTE plan.

September 11, 1987, letter, W. T. Russell, NRC, to J. H. Austin, PECo, requesting additional information to CTE plan.

September 28, 1987, letter, J. H. Austin, PECo, to W. T. Russell, NRC, responding to requests for information to CTE plan.

October 8, 1987, letter, W. T. Russell, NRC, to J. H. Austin, PECo, noting concerns and suspending staff review.

November 19, 1987, letter, E. J. Bradley, PECo, to T. E. Murley, NRC, transmitting application for amendment of operating licenses DPR-44 and DPR-56 to reflect organization changes.

November 25, 1987, letter J. H. Austin, PECo, to W. T. Russe'l, NRC, submitting "Plan for Restart of Peach Bottom Atomic Power Station," Section I, "Corporate Plan."

December 11, 1987, letter, V. Stello, NRC, to J. H. Austin, PECo, transmitting performance assessment.

December 18, 1987, letter, W. T. Russell, NRC, to J. W. Gallagher, PECo, forwarding the amended Systematic Assessment of Licensee Performance Report for February 1, 1986 through May 31, 1987.

December 24, 1987, letter, W. T. Russell, NRC, to J. H. Austin, PECo, discussing restart plan review, Section I.

January 29, 1988, letter, J. H. Austin, PECo, to W. T. Russell, NRC, transmitting a report by the Institute for Nuclear Power Operations January 11, 1988.

February 12, 1988, letter, J. Everett, PECo, to W. T. Russell, NRC, transmitting "Plan for Restart of Peach Bottom Atomic Power Station", Section II, "PBAPS Action."

March 18, 1988, letter, J. F. Paquette, PECo, to W. T. Russell, NRC, on appointments of PECo personnel.

April 8, 1988, letter, J. F. Paquette, PECo, to W. T. Russell, NRC, transmitting Revision I to Sections I and II of the plan for restart and a schedule of major activities in the revised plan.

April 8, 1988, letter, C. A. McNeill, PECo, to W. T. Russell, NRC, information regarding Peach Bottom quality control shift operations monitoring.

May 18, 1988, letter, C. A. McNeill, PECo, to W. F. Kane, NRC, transmitting Inspection Report 50-277/278-88-10 for the routine resident safety inspection from March 12 to April 22, 1988.

May 31, 1988, letter, J. W. Gallagher, PECo, to R. M. Gallo, NRC, transmitting additional information regarding training of plant operators on changes to plant procedures.

June 1, 1988, letter, W. T. Russell, NRC, to C. A. McNeill, PECo, requesting additional information.

June 22, 1988, letter, R. E. Martin, NRC, to W. M. Alden, PECo, transmitting license amendments on the organizational structure.

July 8, 1988, letter, V. Stello, NRC, to J. F. Paquette, PECo, regarding performance assessment.

July 22, 1988, letter, C. A. McNeill, PECo, to W. T. Russell, NRC, responding to request for information regarding plan for restart.

August 9, 1988, letters, J. M. Taylor, NRC, to 36 individual PECo employees, issuing enforcement actions.

August 10, 1988, letter, J. M. Taylor, NRC, to J. F. Paquette, PECo, issuing enforcement action to PECo.

August 15, 1988, letter, J. A. Basilio, PECo, to R. Martin, NRC, providing additional information regarding plan for restart.

August 15, 1988, letter, C. A. McNeill, PECo, to W. T. Russell, NRC, describing PECo's restart self-assessment program.

August 22, 1988, letter, J. A. Basilio, PECo, to R. Martin, NRC, providing additional information regarding plan for restart.

August 23, 1988, letter, J. W. Gallagher, PECo, to W. T. Russell, NRC, providing copies of the restart power testing program.

September 7, 1988, J. W. Gallagher, PECo, to W. T. Russell, NRC, transmitting "Peach Bottom Atomic Power Station Restart Power Testing Program."

September 8, 1988, letter, J. F. Paquette, PECo, to J. Lieberman, NRC, transmitting reply to notice of violation and proposed imposition of civil penalty.

September 20, 1988, J. A. Basilio, PECo, to R. E. Martin, NRC, transmitting additional information regarding the plan for restart.

October 10, 1988, letter, J. A. Basilio, PECo, to R. E. Martin, NRC, providing information in response to issues raised during meeting of September 29, 1988.

APPENDIX B

BIBLIOGRAPHY

ANSI N18.1-1971, American National Standards Institute, Selection and Training of Nuclear Power Plant Personnel; March 8, 1971.

ANSI/ANS-3.1-1981, ANSI/American Nuclear Society, American National Standard for Selection and Training of Nuclear Power Plant Personnel; January 17, 1978.

Federal Register, Vol. 52, No. 67, p. 11386 (52 FR 11386), Philadelphia Electric Co., Peach Bottom Atomic Power Station, Units 2 and 3; Order Suspending Power Operation and Order to Show Cause; U.S. Nuclear Regulatory Commission; April 8, 1987.

APPENDIX C

PUBLIC COMMENTS AND NRC RESPONSE

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APPENDIX C

PUBLIC COMMENTS AND NRC RESPONSE

C.1 INTRODUCTION

Meetings were held on the dates and locations noted below to provide the public the opportunity to comment on the revised "Plan for Restart of the Peach Bottom Atomic Power Station," which was submitted to the U.S. Nuclear Regulatory Commission (NRC) on April 8, 1988. This appendix summarizes those comments and provides the NRC responses to them. Comments were provided at public meetings on September 24 and November 4, 1987, on the licensee's earlier plan, which was superseded by the revised plan for restart. The NRC staff has not responded to the earlier comments, except indirectly if they were similar to those summarized in this appendix.

Fawn Grove, Pennsylvania	May 16, 1988
Pylesville, Maryland	May 16, 1988
Quarryville, Pennsylvania	May 17, 1988

Many comments were similar in nature and were thus grouped into appropriate categories to be covered by a single response. For individual comments that covered multiple categories, the reader is directed to various sections in this safety evaluation report (SER) for a complete response. The summarized comments do not reflect judgment on what was said by the commenters; they merely attempt to capture what was said in language close to that used by the individual commenters. Identical comments made by the same people at more than one meeting are treated as one comment and are only listed once.

Section C.2 lists the names of the commenters and their residences. The commenters are numbered in order of appearance and in the order of the meetings as listed above. Section C.3 provides a summary of the comments with a key to the response number for each comment. Section C.4 provides the staff's responses to specific comments.

C.2 LIST OF COMMENTERS

Fawn Grove, Pennsylvania, May 16, 1988

1 Margaret Dardis, Newtown, Pennsylvania
2 Allan Young, Middletown, Pennsylvania
3 David Grove, New Park, Pennsylvania
4 John Tucker, Dallastown, Pennsylvania
5 Francis Boltz, Sr., Fawn Grove, Pennsylvania
6 Jack Winzenried, Delta, Pennsylvania
7 Bob Hughes, Fawn Grove, Pennsylvania
8 Judy Williams, Delta, Pennsylvania

Pylesville, Maryland, May 16, 1988

9 Ernest Eric Guyll, Nottingham, Pennsylvania
10 George Field, Street, Maryland
11 Joanne Parrott, Harford County, Maryland
12 Jean Ewing, Darlington, Maryland
13 Ginna Bennett, Havre de Grace, Maryland
14 John Casey, Bel Air, Maryland
15 J. Michael Pratt, Virginia
16 David Watson, Street, Maryland
17 Rev. Jeffrey D. Wilson, Street, Maryland
18 Patricia Jeanschild, Delta, Pennsylvania
19 Kenneth J. Trzcinski, Street, Maryland
20 Pat Birnie, Columbia, Maryland
21 Pat Lane, Baltimore, Maryland
22 Greg Skinner, Norrisville, Maryland
23 William G. Shimek, Darlington, Maryland
24 Ernest Eric Guyll, Nottingham, Pennsylvania
25 Stan Kohler, Pylesville, Maryland
26 Barbara A. Risacher, Harford County, Maryland
27 Bryan Merryman, New Park, Pennsylvania

Quarryville, Pennsylvania, May 17, 1988

28 Fred Moser, Quarryville, Pennsylvania
29 Bernard Raftovich, Holtwood, Pennsylvania
30 Wayne Dobson, Douglassville, Pennsylvania
31 Leonard Peoples, Quarryville, Pennsylvania
32 Edward Bailey, Conestoga, Pennsylvania
33 Eric Epstein, Harrisburg, Pennsylvania
34 Frances Skolnick, Lancaster, Pennsylvania
35 Ernest Eric Guyll, Nottingham, Pennsylvania
36 Robert Hughes, Fawn Grove, Pennsylvania
37 H. Eugene Carrigan, New Providence, Pennsylvania
38 Richard Ryan, Quarryville, Pennsylvania
39 Mary Corthouts, West Lampeter, Pennsylvania
40 Rodney Lingo, Holtwood, Pennsylvania
41 Margaret Dardis, Newtown, Pennsylvania
42 Susan Ellenberg, Holtwood, Pennsylvania
43 Donald Kemper, Quarryville, Pennsylvania
44 Phyllis Gilbert, Philadelphia, Pennsylvania
45 Mitzi Samples, Little Britian, Pennsylvania
46 Marie Inslee, Downington, Pennsylvania

C.3 SUMMARY OF COMMENTS

Commenter	Comment	
1	Wants public debate on startup issues.	C.4.1
2	Should not start up with present management in control.	C.4.2
	Alleges past history of inadequate welder examinations.	C.4.6

	Alleges poor welding practices.	C.4.6
	Alleges inadequate shielding was provided for welders.	C.4.6
3	In favor of restart.	C.4.2
4	Believes new management is capable of safely operating plant.	C.4.2
5	Feels confident of new management.	C.4.2
6	Believes new management and personnel will operate plant safely.	C.4.2
7	In favor of restart.	C.4.2
8	Confident of new management.	C.4.2
9	Desires information on accidental releases of radiation at Peach Bottom (amounts), and what is "safe."	C.4.7
	How do cancer, stillbirth, and birth defect rates near Peach Bottom compare with national averages?	C.4.8
	Concerned that monetary issues at plant will take back seat to safety.	C.4.11
	How does warm wat r affect fish in the Susquehanna River?	C.4.9
10	Does not feel management change has had any effect.	C.4.2
11	Wants INPO [Institute of Nuclear Power Operations] evaluation before startup.	C.4.11
	Alleges improprieties concerning security guards (sleeping at their posts, drinking alcohol, long hours, inadequate staffing, inadequate breaks, poor facilities, etc.)	C.4.5
	Alleges Susquehanna River water quality reports were altered to downgrade radiation levels.	C.4.13
	Alleges contaminated items were stored in faulty containers.	C.4.19
	Concerned about quality of maintenance actions being performed by PECo personnel in light of the illicit drug activity at the plant.	C.4.4
	Concerned about lack of fire drills with local fire-fighting companies.	C.4.14

12	What is probability of containment failure in event of core melt - 90 percent?	C.4.15
	Mark I containment is not safe.	C.4.15
	Concerned about cracks in the concrete, piping, and welds.	C.4.11
	Concerned about cost of cleanup of the plant after decommissioning.	C.4.16
13	Concerned about dangers of plutonium and cost of cleanup.	C.4.16
14	Confident of PECo management.	C.4.2
15	Management is committed to do a good job.	C.4.2
16	Peach Bottom problems need further attention by NRC and PECo to correct and prevent recurrence.	C.4.3
	Drugs still a problem.	C.4.4
	Concerned about Mark I containment.	C.4.15
17	Confidence in PECo has been restored. Delaying startup further would demoralize employees and reverse gains made.	C.4.3
18	Alleges some PECo employees are not fit to operate plant (brag about heavy drinking and taking drugs). Poor attitude toward work exists.	C.4.4
19	What assurance is there that management will not deteriorate in the future?	C.4.2
20	Wants adjudicatory hearing to address restart issues.	C.4.1
	Peach bottom has unsafe design and should not restart unless redesigned.	C.4.12
	New emission monitoring device should be installed with public access to monitoring information.	C.4.7
	Wants comprehensive health studies around Peach Bottom.	C.4.8
	Nuclear plants are not economical.	C.4.17
	Doubts evacuation possibility.	C.4.18
	Concerned about radwaste storage. Wants spent fuel transferred to dry cask storage.	C.4.19
21	Concerned about amounts of radwaste.	C.4.19
	Concerned about Mark I containment.	C.4.15

	Generic problems are addressed too slowly, thus causing lack of faith in NRC.	C.4.20
22	More emphasis needs to be placed on training with local fire agencies.	C.4.14
23	Concerned about Mark I containment.	C.4.15
24	Duplicate of comments by commenter 9.	C.4.7, 8,11,9
25	Wants assurances of personnel reliability, no future mechanical failures, and no spurious radioactive releases or else do not start up.	C.4.3
26	Wants Mark I containment issue resolved before startup.	C.4.15
	Desires PECo response to INPO letter regarding unanswered General Electric service letters and outstanding work orders.	C.4.10
	Wants Advisory Committee on Reactor Safeguards to do safety analysis of Peach Bottom before restart.	C.4.12
27	Encouraged by new management's commitment to safety.	C.4.2
28	In favor of restart (cites employment, taxes, and recreation provided by plant. Ecologically sound.)	C.4.2
29	Plant was shut down because of poor management. This has been corrected. Plant should now restart.	C.4.2
30	Sees positive changes in management and employee attitudes.	C.4.2
31	Restart plan is adequate and should be accepted.	C.4.2
32	PECo employees have genuine commitment to excellence.	C.4.3
33	Concerned about INPO letter of October 1987, especially lack of accountability and excessive open maintenance items.	C.4.10
	Concerned about INPO president's criticism of January 11, 1988, of PECo's management and reorganization plan.	C.4.2
	Concerned about drug use at plant.	C.4.4
	Illegal to consider economic benefits to community in considering restart.	C.4.17
	Peach Bottom is not needed.	C.4.17
	Concerned about security practices at plant (long hours for guards, no meal breaks, no rotation, etc.).	C.4.5

	Wants hearings on restart issues.	C.4.1
34	Concerned whether PECo has resources to carry out restart plan.	C.4.10
	Concerned that NRC is too cozy with nuclear industry to regulate it.	C.4.20
	Plan does not address containment, spent fuel reracking, and adequacy of offsite radiation monitoring equipment.	C.4.21
	Wants hearings on proposed amendments of the Technical Specifications.	C.4.1
	What are NRC's restart criteria?	C.4.22
35	Duplicate of comments by commenter 9.	C.4.7, 8,9,11
36	Environmental monitoring at plant began in 1966 and results are available in library.	C.4.7
	Personnel changes will improve operation at Peach Bottom.	C.4.3
37	PECo has vested interest in Peach Bottom and would not want an accident destroying it and its customers.	C.4.2
	Peach Bottom is needed to prevent acid rain and minimize need to import oil.	C.4.17
38	In favor of restart.	C.4.2
39	Concerned about plant being on a geological fault that had two earthquakes in last 10 years.	C.4.23
40	In favor of restart.	C.4.2
41	Concerned about provision of the evacuation plan to use schools as shelters (dismissing the children) in violation of Pennsylvania guidelines.	C.4.18
42	In favor of restart.	C.4.2
43	In favor of restart.	C.4.2
44	Wants evidentiary hearings on restart.	C.4.1
	Concerned about Mark I containment.	C.4.15
	Concerned about nuclear waste.	C.4.19

	Concerned about provision of the evacuation plan to use schools as shelters (dismissing the children) in violation of Pennsylvania guidelines.	C.4.18
	Wants independent safety investigation before startup.	C.4.12
45	Concerned about plant decommissioning.	C.4.16
46	Nuclear power is unsafe.	C.4.12

C.4 NRC RESPONSE TO COMMENTS

Commenter — Comment C.4.1: Requests For Public Hearings

1 Wants public debate on startup issues.

20 Wants adjudicatory hearing to address restart issues.

33 Wants hearings on restart issues.

34 Wants hearings on proposed amendments of the Technical Specifications.

44 Wants evidentiary hearings on restart.

Response:

Numerous meetings have been held with the licensee, State and local governmental groups, and the public since the shutdown of Peach Bottom station to provide all interested parties an opportunity to comment on the deliberations on the station.

The Commonwealth of Pennsylvania and the State of Maryland provided comments dated July 12 and May 26, 1988, respectively. These comments were forwarded to the licensee for consideration, and the licensee's submittal of July 22, 1988, provided an itemized response to the State of Maryland's comments.

In addition to its comments, the Commonwealth of Pennsylvania has chosen to intervene in certain of the PBAPS proceedings by filing a "Petition To Intervene, Request for Hearings and Comments Opposing No Significant Hazards Consideration" on January 22, 1988. This petition concerned the licensee's application for amendment of the facility's Technical Specifications in regard to the administrative controls on the licensee's organizational structure. The Commonwealth supplemented this petition on August 24, 1988, which included seven contentions. The Commonwealth and the licensee have recently agreed to a postponement of a formal response to these contentions, before the Atomic Safety and Licensing Board appointed for this matter, until November 7, 1988, pending the potential resolution of these issues by the parties before that date.

Commenter	Comment C.4.2: Adequacy of Management
2	Should not start up with present management in control.
3, 7, 28, 38, 40, 42, 43	In favor of restart.
4	Believes new management is capable of safely operating plant.
5	Feels confident of new management.
6	Believes new management and personnel will operate plant safely.
8	Confident of new management.
10	Does not feel management change has had any effect.
14	Confident of PECo management.
15	Management is committed to do a good job.
19	What assurance is there that management will not deteriorate in the future?
27	Encouraged by new management's commitment to safety.
29	Plant was shut down because of poor management. This has been corrected. Plant should now restart.
30	Sees positive changes in management and employee attitudes.
31	Restart plan is adequate and should be accepted.
33	Concerned about INPO president's criticism of January 11, 1988, of PECo's management and reorganization plan.
37	PECo has vested interest in Peach Bottom and would not want an accident destroying it and its customers.

Response:

Several versions of the PECo plan for restart have all addressed management. The INPO report of January 11, 1988, was highly critical of an interim version of the plan for restart, and INPO's conclusions and recommendations were similar to concerns raised by the NRC during its review of the several versions of the plan.

The initial corrective action plan was submitted by the licensee in August 1987 and was followed by an NRC staff position in October 1987 that stated that the plan failed to address a fundamental staff concern. In November 1987, the licensee submitted Section I of its revised corrective action plan for restart in

response to the issue raised by the staff. In February 1988, the licensee completed the plan with the submittal of Section II, which addressed actions specific to the onsite organization and the plant.

The licensee's actions in response to the INPO report were discussed in its letter of April 8, 1988, which submitted Revision 1 of the plan for restart. The licensee indicated that it had incorporated the second and third recommendations of the INPO letter into the revised plan. These recommendations dealt with minimizing actions that bypassed or undermined line management and with establishing accountability for the unsatisfactory situation that had developed over a period of years.

The licensee also stated in this letter that an independent consultant had been retained to respond to INPO's first recommendation that a detailed analysis of the licensee's internal investigation material be developed.

By letter dated March 4, 1988, the staff requested that any information the licensee provided to INPO in response to the issues in the INPO report also be provided to the NRC and that the NRC be apprised of the results of INPO evaluations before restart.

The NRC will complete its evaluation of Peach Bottom's readiness for startup only after all appropriate information, including the results of the INPO evaluations, have been provided by the licensee.

Since the staff is concluding that the licensee's plan for restart is acceptable, subject to the conditions stated in this report, no further response is provided to the comments listed above that generally expressed satisfaction with the status of Peach Bottom.

Commenter	Comment C.4.3: Readiness for Restart
16	Peach Bottom problems need further attention by NRC and PECo to correct and prevent recurrence.
17	Confidence in PECo has been restored. Delaying startup further would demoralize employees and reverse gains made.
25	Wants assurances of personnel reliability, no future mechanical failures, and no spurious radioactive releases or else do not start up.
32	PECo employees have genuine commitment to excellence.
36	Personnel changes will improve operation at Peach Bottom.

Response:

The issues identified by the NRC as restart items have been or will be evaluated by the NRC to verify that they have been adequately resolved. The NRC plans to perform a systematic assessment of licensee performance and conduct an

integrated assessment team inspection to evaluate the effectiveness of the licensee's corrective action programs and the readiness of the plant equipment and personnel to resume power operation before it makes any decision on restart.

The NRC will complete its evaluation of Peach Bottom's readiness for startup only after it has received all appropriate information and plan revisions from the licensee and has reviewed all followup inspection results.

Commenter	Comment C.4.4: Fitness for Duty
11	Concerned about quality of maintenance actions being performed by PECo personnel in light of the illicit drug activity at the plant.
16	Drugs still a problem.
18	Alleges some PECo employees are not fit to operate plant (brag about heavy drinking and taking drugs). Poor attitude toward work exists.
33	Concerned about drug use at plant.

Response:

The NRC expects management at all nuclear power plants to aggressively implement effective fitness-for-duty programs. PECo is responsible for ensuring the fitness for duty of all employees at Peach Bottom. The basic fitness-for-duty program at Peach Bottom includes those elements that are expected to be implemented at all operating nuclear power plants. These include worker training in drug awareness and company policy, supervisory training in observation of behavior, an employee assistance program, and drug testing on a preemployment and for-cause basis. On the basis of the results of the program and an NRC inspection of the program, the staff concludes that the licensee has implemented an adequate program at Peach Bottom to detect and correct drug abuse.

In addition to implementation of industrywide programs, such as preemployment and for-cause drug testing, the licensee has taken additional steps at Peach Bottom, including annual and random drug testing, undercover investigations, searches of the plant by trained dogs, and a policy that encourages confidential reporting of drug involvement by concerned coworkers. The NRC will continue to monitor activities at Peach Bottom to ensure that responsible actions are taken when management becomes aware of any case of drug involvement. A proposed rulemaking being developed by the NRC staff would further strengthen the ability of PECo and other utilities to identify and correct drug abuse problems by prescribing sanctions against those individuals possessing or using drugs while on the job at nuclear power plants.

Regarding concerns about the quality of maintenance performed in light of the drug activity at the plant, the licensee has an extensive quality assurance program to identify and correct poor or improper maintenance actions irrespective of their cause. This detailed program serves as a double check on maintenance work to minimize the possibility that an improperly maintained item is left uncorrected to degrade the performance of a safety-related system. Additionally, as discussed further in this appendix, to analyze the quality of the

maintenance effort of the licensee's employees, an NRC inspection team has completed a programmatic review by evaluating maintenance and postmaintenance testing records, witnessing selected maintenance and postmaintenance testing activities, and inspecting the physical condition of equipment in the plant.

Commenter	Comment C.4.5: Security
11	Alleges improprieties concerning security guards (sleeping at their posts, drinking alcohol, long hours, inadequate staffing, inadequate breaks, poor facilities, etc.)
33	Concerned about security practices at plant (long hours for guards, no meal breaks, no rotation, etc.).

Response:

These and several previous concerns regarding the guard force at Peach Bottom have been investigated by the NRC in the past and have been partially substantiated. During certain periods in the past, security force staffing was insufficient to permit the desired frequency of post rotation and relief. The staffing shortage resulted in substantial overtime so that security personnel typically worked 60 to 70 hours a week.

Although the problem has not been fully resolved, the licensee has made significant inroads in correcting it. Staffing has been increased by 50 percent in the past year. The security force now rotates guards on posts at 2- to 3-hour intervals, and overtime for the security force is now averaging less than 4 hours a week per individual (watchmen and armed guards). A policy to reduce overtime has been implemented. The licensee has transferred or reassigned its two senior security managers at Peach Bottom and has recently switched to a new security contractor.

During an NRC security inspection conducted during the week of July 25-29, 1988, the staff noted that staffing problems still exist. The NRC informed the licensee of its continuing concerns and intends to conduct an additional security inspection to assess the effectiveness of corrective actions before it makes a decision on startup.

Commenter	Comment C.4.6: Welding
2	Alleges past history of inadequate welder examinations.
2	Alleges poor welding practices.
2	Alleges inadequate shielding was provided for welders.

Response:

NRC inspectors conducted two programmatic safety inspections at Peach Bottom during March 14-18 and May 9-20, 1988. These inspections focused on welding and nondestructive testing associated with a recently completed pipe replacement program. In addition, the NRC conducted another inspection on June 14 and 15, 1988, to investigate an unrelated allegation regarding welding.

During the two programmatic safety inspections, the inspectors observed welding in progress, visually inspected completed welds, and reviewed work and material certification packages for selected welds. The inspectors then conducted onsite independent measurements to verify the adequacy of the licensee's nondestructive examination program. Testing included x-ray alloy analysis, dye penetrant examination, visual examination, ferrite examination, and ultrasonic testing. No violations were identified on any weld tested. The plant's quality assurance (QA) program was evaluated by a review of licensee audit and surveillance reports. The inspectors concluded that the licensee had significantly increased its effort in this area through meaningful and indepth reviews of contractor activities. Inspection Reports 50-277/88-08, 50-278/88-08, and 50-278/88-14 contain the results of the inspections.

The inspection on June 14 and 15, 1988, revealed improper welds on some reactor water cleanup (RWCU) system piping, but the cause was not inadequate pipe fitup as alleged. All the welds had been previously identified by QA personnel and subsequently were repaired. During this inspection, the inspectors also learned that as a result of an unrelated review, two welders were found welding on small-bore pipe for which they were not qualified. The welds were removed and rewelded by properly qualified welders. The licensee reported this incident in a nonconformance report. In another unrelated instance, a welder was found welding with a metal electrode on which he was not qualified. The licensee also reported this incident in a nonconformance report. Thus, 3 of approximately 900 welders were found unqualified for specific tasks that they were performing.

The inspectors concluded that no violation or safety issue existed. Although some conditions were substantiated by the inspector (e.g., rejection of welds in the RWCU system and unqualified welders), these situations had been identified by the licensee's QA program and appropriate corrective action had been taken.

Commenter	Comment C.4.7. Environmental Monitoring
9	Desires information on accidental releases of radiation at Peach Bottom (amounts), and what is "safe."
20	New emission monitoring device should be installed with public access to monitoring information.
36	Environmental monitoring at plant began in 1966 and results are available in library.

Response:

Environmental radiation monitoring in the Peach Bottom vicinity began in March 1960 as part of the preoperational tests for Unit 1 (now decommissioned). The monitoring program has continued to the present and was expanded with the advent of Units 2 and 3. Twelve environmental sampling stations were set up in locations ranging from local areas, which included the plant site, Delta, Holtwood, and Conowingo Dams, and Wakefield, to more distant areas, which included Philadelphia and Hackett Point Bar.

This environmental program is designed to monitor various types of pertinent materials in the food chains of both animals and humans. Samples are taken of the atmospheric, terrestrial, and aquatic environments, using those media that are sensitive indicators of changes in the environmental radioactivity such as particulate matter in air, water, soil, and sediment, as well as those that could enter the human food chain such as potable water, milk, vegetation, and fish. The program also monitors the general levels of radioactivity in the environment. Dose assessment began in May 1971 at eight locations and was later expanded to 35 locations. Periodic reports of the data are provided and are available to the public.

The general levels of radioactivity at the site and in the surrounding regions were found to be generally low at the beginning of the survey period, but rose rapidly in 1961 because of weapons testing, and continued at a relatively high level into 1963. From late 1963 through 1967, dispersion and decay generally reduced activity levels to the 1960 levels. Radioactivity levels again rose in 1968 through 1971 because of additional weapons testing in various parts of the world, then decreased again in 1972 and 1973. In contrast, releases from Peach Bottom, even though local to the monitors, were essentially undetectable by the general radiation monitors and produced no measurable lasting radioactive deposits. This brief history should provide a helpful background for examining the actual data contained in the periodic reports.

The Commission conducts a separate, independent dose monitoring program around Peach Bottom and other reactors. The data are published quarterly in NUREG-0837, "NRC TLD Direct Radiation Monitoring Network." Data for Peach Bottom are available since 1982. Doses measured by the NRC (which are averaged over 3 months) during releases at Peach Bottom have been indistinguishable from natural background radiation.

Commenter	Comment C.4.8: Health Effects
9	How do cancer, stillbirth, and birth defect rates near Peach Bottom compare with national averages?
20	Wants comprehensive health studies around Peach Bottom.

Response:

Due to the general nature of the comment a specific response which focuses on any specific aspect of the Peach Bottom plants' operation cannot be prepared. However, the staff notes that in addition to its routine monitoring around all of the nuclear power plants in the Commonwealth of Pennsylvania, the Pennsylvania Department of Health, Division of Epidemiological Research is currently conducting a comprehensive health study in the vicinity of Peach Bottom. Among the items being evaluated are the rates of new cancers, stillbirths, and birth defects. The study is expected to be completed in the near future.

The staff is not aware of any well founded studies which indicate a significant increase (or decrease) in infant mortality or the incidence of cancer related to the operation or the recent shutdown of the Peach Bottom plant.

The effects of radiation on living systems have been studied for decades by individual scientists as well as by select committees that have been formed to objectively and independently assess the risk from radiation. These studies were considered in the development of the public health and safety limits that apply to the Peach Bottom plant, as well as to other nuclear power plants. The studies have not detected a statistically significant increase in cancer for doses and dose rates normally encountered in the vicinity of nuclear power plants. However, as a prudent measure, the NRC staff assumes that there is a linear relation between cancer and low doses of radiation. NRC limits are selected so that the statistical probability of risk is extremely low.

Commenter	Comment C.4.9: Warm Water Effects on Fish
9	How does warm water affect fish in the Susquehanna River?

Response:

Because the effects of thermal discharges on aquatic life have been extensively discussed in the literature, a detailed answer would be too lengthy. A suitable reference is Heated Effluents and Effects on Aquatic Life With Emphasis on Fishes: A Bibliography by E. C. Raney, B. W. Menzel, and E. C. Weller. Two of the more important points are that thermal discharges are not as detrimental to aquatic life as originally thought, and many aquatic organisms, particularly fishes, are capable of sensing and avoiding lethal temperatures if given a chance to do so.

To ensure protection of the river and compliance with river water quality criteria, the Pennsylvania Department of Environmental Resources regulates the quantity and quality of the waste water discharged from the station, including heat dissipation. Cooling towers are used at Peach Bottom to dissipate a large amount of its heat to the atmosphere to comply with these regulations. Environmental studies done at Peach Bottom before the plant was initially permitted to operate have documented the minimal effect on aquatic life resulting from thermal discharges within the allowed limits.

Commenter	Comment C.4.10: INPO Evaluations
11	Wants INPO evaluation before startup.
26	Desires PECo response to INPO letter regarding unanswered General Electric service letters and outstanding work orders.
33	Concerned about INPO letter of October 1987, especially lack of accountability and excessive open maintenance items.
34	Concerned whether PECo has resources to carry out restart plan.

Response:

The large number of open maintenance items is not unusual for a plant in shutdown. During periods of operation, any plant accumulates a backlog of outstanding maintenance items that can or must be deferred until an outage. When a plant shuts down for a major outage, additional preventive maintenance items

that must be completed during the outage are added to the backlog. This occurs for any type of plant regardless of its power source. Moreover, potential problems identified to the utility by the NRC or INPO that require maintenance actions to investigate and correct frequently add to the backlog. For example, a generic industry problem with a particular type of valve (of which there may be several hundred in the plant) could lead to several hundred maintenance items. During an outage, maintenance activities would be scheduled so that tasks on safety-related equipment would have a high priority. Consequently, some open maintenance items on non-safety-related equipment (having a lower priority) may be deferred until a subsequent outage. Therefore, these low-priority items also contribute to the backlog. Additionally, the maintenance backlog is further influenced by the inability to complete testing on a refurbished component because of existing plant conditions (certain testing requires the plant to be operating).

In its review of the PECo restart plan, the NRC is paying particular attention to the maintenance backlog as part of the plant readiness criteria, including equipment operability and sufficient maintenance resources.

In addition, the Commission issued its Policy Statement on Maintenance of Nuclear Power Plants on March 23, 1988. This policy statement identifies the activities that form the basis of an adequate maintenance program and provides guidance to the industry on improving maintenance programs. The NRC also will review the Peach Bottom maintenance program in light of this policy statement. An inspection team completed a programmatic review by evaluating maintenance and postmaintenance testing records, witnessing selected maintenance and postmaintenance testing activities, and inspecting the physical condition of equipment in the plant.

Commenter	Comment C.4.11: Priority of Safety Concerns
9	Concerned that monetary issues at plant will take back seat to safety.
12	Concerned about cracks in the concrete, piping, and welds.

Response:

Current programs require licensees to identify and monitor the condition of reactor system components vulnerable to corrosion or embrittlement. These programs are required to ensure that any degradation of components is detected and evaluated. If necessary, plant modifications may be required to ensure that operation of the plant will be within the previously approved design envelope.

Although the NRC recognizes that repair/replacement costs for some components may be substantial, its primary emphasis and concern is to ensure that necessary plant modifications restore the plant condition to the original design basis so that operation of the plant does not endanger the health and safety of the public.

Commenter	Comment C.4.12: Safety Investigations
20	Peach Bottom has unsafe design and should not restart unless redesigned.
26	Wants Advisory Committee on Reactor Safeguards to do safety analysis of Peach Bottom before restart.
44	Wants independent safety investigation before startup.
46	Nuclear power is unsafe.

Response:

The General Accounting Office (GAO) is studying the Peach Bottom case. The NRC staff will consider all information relevant to a Peach Bottom restart decision, including information provided by GAO, that is available at the time such a decision is made. In addition, the Advisory Committee on Reactor Safeguards plans to conduct deliberations on the Peach Bottom restart during meetings that will be open to the public. The opportunity for public comment and other aspects of the conduct of these meetings will be provided in the Federal Register notice announcing the time and dates of such meetings.

Commenter	Comment C.4.13: Water Quality
11	Alleges Susquehanna River water quality reports were altered to downgrade radiation levels.

Response:

During an interview between PECo and the alleger, it was determined that the allegation regarding Susquehanna River water quality reports was based on information received second hand from a contractor employee last employed at Peach Bottom in 1976. Specific information on or any first-hand knowledge of such activity or any indication that it is continuing could not be provided. Lacking any details of the allegation and considering the time period in which it was alleged to have occurred, no further investigation is considered appropriate.

Commenter	Comment C.4.14: Fire Protection
11	Concerned about lack of fire drills with local fire-fighting companies.
22	More emphasis needs to be placed on training with local fire agencies.

Response:

PECo's Peach Bottom Fire Protection Program has received extensive NRC review and approval. The program identifies numerous fire protection features that minimize the potential for fires, ensure timely and effective fire-fighting capability, and ensure safe shutdown of the plant in the event of a fire. These capabilities do not rely on support from the local fire department. The

five-man fire brigade is trained to handle most station fires without support from the fire department. The local fire department will be requested to respond if its support is deemed necessary. To ensure that local fire departments can effectively support station fire-fighting efforts, they are provided with annual training in accordance with the PBAPS Emergency Plan. This training was last conducted on August 22 and 24, 1988.

Commenter	Comment C.4.15: Containment
12	What is probability of containment failure in event of core melt - 90 percent?
12	Mark I containment is not safe.
16	Concerned about Mark I containment.
21	Concerned about Mark I containment.
23	Concerned about Mark I containment.
26	Wants Mark I containment issue resolved before startup.
44	Concerned about Mark I containment.

Response:

The containment structure is designed to prevent the release of substantial quantities of radioactivity in the event of any one of a number of postulated accidents which are referred to as design basis accidents. Our safety research on reactor accidents has provided us with a number of insights. Among these are that the Mark I containment design provides a significant safety margin for accidents even worse than the design basis accident, and that such severe accidents have a low probability of occurrence.

The NRC believes that the BWR Mark I plants are safe and that they pose no undue public health risk. Nevertheless, the NRC is pursuing a vigorous program to reduce even further the already very low likelihood of occurrence of a severe accident and to improve the capability of plants to mitigate the consequences of such accidents. The NRC's most recent program in this regard was begun several years ago and a final report with recommendations by the NRC staff is expected in the near future.

Commenter	Comment C.4.16: Decommissioning
12	Concerned about cost of cleanup of the plant after decommissioning.
13	Concerned about dangers of plutonium and cost of cleanup.
45	Concerned about plant decommissioning.

Response:

Section 50.54(bb) of Title 10 of the Code of Federal Regulations (10 CFR) requires that no later than 5 years before the expiration of the reactor operating license, licensees of operating nuclear power reactors shall submit written notification to the Commission, for its review and preliminary approval, of the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor upon expiration of the reactor operating license until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository. Final Commission review will be undertaken as part of any proceeding for continued licensing under 10 CFR Parts 50 or 72. The licensee must demonstrate to the NRC that the elected actions will be consistent with NRC requirements for licensed possession of irradiated nuclear fuel and that the actions will be implemented on a timely basis.

The issue of spent fuel repositories is discussed elsewhere in this appendix.

Commenter	Comment C.4.17: Economics and Need for Power
20	Nuclear plants are not economical.
33	Illegal to consider economic benefits to community in considering restart.
33	Peach Bottom is not needed.
37	Peach Bottom is needed to prevent acid rain and minimize need to import oil.

Response:

The NRC staff does not routinely evaluate issues such as need for power, alternate energy sources, or economic benefits in connection with the continued authorization of operation of operating nuclear power plants unless such issues arose that would require an environmental impact statement pursuant to 10 CFR 51 or a consideration of a backfit issue pursuant to 10 CFR 50.109. To date the staff's consideration of the Peach Bottom issues, as discussed in this SER, have not involved such issues. The staff does recognize, however, that such economic issues may typically be considered by local public utility commissions.

Commenter	Comment C.4.18: Emergency Planning
20	Doubts evacuation possibility.
41	Concerned about provision of the evacuation plan to use schools as shelters (dismissing the children) in violation of Pennsylvania guidelines.
44	Concerned about provision of the evacuation plan to use schools as shelters (dismissing the children) in violation of Pennsylvania guidelines.

Response:

Evacuation is one element considered in emergency planning. Although it is highly unlikely that evacuation would be required, the NRC requires that such a contingency be considered in developing emergency plans.

The Peach Bottom emergency plan was prepared using a variety of sources as guidance including NRC acceptance criteria primarily based on lessons learned from TMI-2. Experience gained in developing and demonstrating previous Peach Bottom emergency plans and the PECo Procedures for Electric Service Restoration in Major Emergencies has been incorporated into this emergency plan. Close cooperation with State and county civil agencies has been established so that State, county, and facility emergency plans are compatible.

PECo has written agreements with Pennsylvania and the counties of Chester, Lancaster, and York as well as memos of understanding with Maryland and the counties of Cecil and Harford. If a situation requiring sheltering or evacuation should occur, the utility's responsibility is to provide notification, supply continuing information, and make recommendations to the State and counties at risk. It is the State and county plans that cover alerting of the general public in the affected area and give details for protection of this population, including provisions for protective actions such as sheltering or evacuating personnel from affected sections. These plans in general call for sirens, police patrol cars, and other emergency vehicles with public address systems to warn and evacuate appropriate sectors within the plume exposure emergency planning zone (EPZ). The Pennsylvania Emergency Management Agency plan recognizes that the safety of school children is the key factor in any protective action. Its plan calls for school children whose schools are located outside the EPZ to be retained in the schools they attend, or if located inside the EPZ, to be evacuated to host schools. The children will be retained in the school until they are picked up by their parents or guardians. School children will not be sent home at any time when an evacuation is in progress. In any case, the responsibility for any protective action for the public, including evacuation, lies with the State.

Training on the Peach Bottom emergency plan is provided to emergency organization personnel who are assigned to positions on the basis of experience during normal operations. Training by lecture, drills and exercises is used to familiarize personnel with specific emergency responsibilities. Training and education are applicable to PECo personnel, supporting agencies, private citizens, and news media personnel. PECo conducts periodic exercises to test plan effectiveness that are monitored by the NRC. State and local agencies also carry out field practices of their emergency plans to evaluate their ability to carry out evacuations. These exercises are observed by the Federal Emergency Management Agency (FEMA). Provisions within the emergency plan provide for periodic review and revision of the emergency plan. The plan and associated procedures are reviewed annually to consider their effectiveness and organization; results of drills, exercises, and training; and new or revised regulations. Results obtained from past exercises have demonstrated the ability to implement protective actions, including evacuation.

Commenter	Comment C.4.19: Radwaste
11	Alleges contaminated items were stored in faulty containers.
20	Concerned about radwaste storage. Wants spent fuel transferred to dry cask storage.
21	Concerned about amounts of radwaste.
44	Concerned about nuclear waste.

Response:

The "faulty containers" refer to drums that were stored outdoors on pallets near the diesel generator building in a tented area. These drums were in a temporary storage area awaiting offsite disposal. They contained low-level oil solidified with Environstone, which is a cement-based solidification agent. The average dose rate from each was approximately 0.2 millirem/hr on contact. All of the containers were properly covered with lids, and although a number had some rust, they did not pose a radiological hazard.

The NRC initiated a rulemaking proceeding on October 25, 1979, to assess generically the degree of assurance that radioactive waste can be disposed of safely, to determine when such disposal or offsite storage will be available, and to determine if radioactive wastes can be safely stored on site past the expiration of existing facility licenses until offsite disposal or storage is available. This proceeding became known as the "Waste Confidence Rulemaking." The Commission's decision is summarized in the following findings:

(1) The Commission found reasonable assurance that safe disposal of high-level radioactive waste and spent fuel in a mined geologic repository is technically feasible.

(2) The Commission found reasonable assurance that one or more mined geologic repositories for commercial high-level radioactive waste and spent fuel will be available by the years 2007-08, and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial high-level radioactive waste and spent fuel originating in such reactor and generated up to that time.

(3) The Commission found reasonable assurance that high-level radioactive waste and spent fuel will be managed in a safe manner until sufficient repository capacity is available to ensure the safe disposal of all high level radioactive waste and spent fuel.

(4) The Commission found reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impact for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations.

(5) The Commission found reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.

In keeping with its commitment to issue rules providing procedures for considering environmental effects of extended onsite storage of spent fuel in licensing proceedings, the Commission issued changes to 10 CFR Parts 50 and 51. In adopting changes to 10 CFR 50.54, the Commission established procedures to confirm that there will be adequate lead time for whatever actions may be needed at individual reactor sites to ensure that the management of spent fuel following the expiration of the reactor operating license will be accomplished in a safe and environmentally acceptable manner. Accordingly, no discussion of any environmental impact of spent fuel storage for the period following expiration of the license or amendment applied for is required in connection with the issuance or amendment of an operating license for a nuclear reactor.

For a more extensive discussion of these rulemakings, see the Federal Register (49 FR 34658, August 31, 1984).

Commenter	Comment C.4.20: NRC
21	Generic problems are addressed too slowly, thus causing lack of faith in NRC.
34	Concerned that NRC is too cozy with nuclear industry to regulate it.

Response:

Among its responsibilities, the NRC is charged with conducting research in support of the licensing and regulatory process. This function is performed through evaluation of operating experience and confirmatory research. Regulations are proposed on the basis of the information obtained from this process. Although a specific rule issued by the Commission may, according to the current body of scientific and technical knowledge, be viewed as the most sound, future operating experience or research may show otherwise. In evaluating the growing body of operating experience and technical knowledge, the Commission weighs the cost of a rule change against the benefits that change would produce. In many instances, additional operating experience or research (requiring additional time) is needed to establish the basis for a rule change. When existing rules (or generic issues) have allowed extended safe operations with an acceptable level of risk, a significant body of evidence must be produced to warrant a change.

The NRC staff would not agree that the actions taken with respect to Peach Bottom, which as detailed in Section 2 of the SER include the shutdown of the plant for over a year and enforcement actions against PECo and certain of its employees, support the proposition that NRC is "too cozy with the nuclear industry to regulate it."

Commenter Comment C.4.21: Spent Fuel Reracking

34 Plan does not address containment, spent fuel reracking, and adequacy of offsite radiation monitoring equipment.

Response:

The spent fuel reracking issue is not directly related to those issues addressed by the NRC's shutdown order of March 31, 1987, and, therefore, is not addressed by the licensee's plan for restart. Nevertheless, it is noted that the currently installed capacity will last until 1995, with a reserve full-core discharge, for Unit 2, and until 1996, with a reserve full-core discharge, for Unit 3 when in-progress modifications are completed in early 1989. Containment and offsite radiation monitoring are responded to under the categories covering concerns about the containment and environmental radiation monitoring, respectively.

Commenter Comment C.4.22: Restart Criteria

34 What are NRC's restart criteria?

Response:

The staff's review of the issues associated with the shutdown of Peach Bottom that includes the staff's approach to enforcement actions, the staff's review of PECo's response to the shutdown issues, and other activities involved in any determination of readiness for restart are discussed in Sections 1 and 2 of this SER.

Commenter Comment C.4.23: Seismology

39 Concerned about plant being on a geological fault that had two earthquakes in last 10 years.

Response:

Peach Bottom lies in an area that has experienced a moderate amount of minor earthquake activity. Most of the reported earthquakes have occurred in the Piedmont Province in which the site is located. The closest fault is associated with the Peach Bottom Syncline located approximately 1 mile south of the site. Studies indicate that the Peach Bottom fault and similar nearby faults have completely healed. The most recent fault movement in the region is believed to have occurred during Mesozoic time between 140 and 200 million years ago.

Records of the occurrence of earthquakes in southeastern Pennsylvania and the surrounding areas date back to the early 18th century. Many earthquakes have been reported since that time and some of these caused minor structural damage; however, none can be considered to be of great or catastrophic proportion. On the basis of the seismic history of the area, a maximum credible earthquake was selected against which the plant was designed. This earthquake is considered to be the largest shock in the region at the closest epicentral distance to the site consistent with geologic structure. Class I (safety-related) facilities

- at the plant are designed to withstand ground accelerations that could result from a shock of about the same size as the earthquake of 1871 (Wilmington), 1883 (Harford County), or 1889 (southeast Pennsylvania) at the closest approach to the site of their related geologic structure.

Additional details on the geologic and seismologic characteristics of the area and the supporting studies and surveys can be found in Section 2.5 of the Peach Bottom Final Safety Analysis Report.