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Facility: Peach Bottom Atomic Power Station
Location: Delta, Pennsylvania
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EXECUTIVE SUMMARY

1 OBJECTIVES

The Team was chartered with the objective of providing NRC senior managers with a current assessment of licensee performance in the functional areas of operations, radiological controls, maintenance and surveillance, engineering and technical support, and safety assessment and quality verification. The Team conducted a broad-based inspection which utilized extensive inspector experience and expertise in applying performance-based inspection techniques. Additionally, the Team compared the level of performance it observed with that characterized in the most recent Systematic Assessment of Licensee Performance (SALP) report.

2 OVERALL CONCLUSION

The Team concluded that Peach Bottom Atomic Power Station is being operated and maintained in a safe manner. Philadelphia Electric Company, the licensee, has initiated a multi-faceted effort to improve supervisory training and establish supervisory responsibility and accountability. Additionally, several promising programs and initiatives have been recently established to improve performance and to address previously identified weaknesses. However, these programs have not been in place for a sufficient period to assess their long-term effectiveness. Notwithstanding observed performance levels that evidenced the overall safe operation of the facility consistent with previous NRC assessments, the Team observed weaknesses in licensee evaluation of degraded or inoperable control room instrumentation and permanently installed plant instrumentation. Weaknesses were also identified in the lack of interim corrective actions for self-assessment findings and in the control of documents related to modifications and temporary plant and procedure changes.

3 CONCLUSIONS FOR EACH AREA

3.1 Operations

Operations performance was generally consistent with the conclusions in the previous SALP report. Control room operators were attentive, knowledgeable, and conducted themselves in a professional manner. Staffing levels were appropriate and interdepartmental communications were effective. However, the Team identified weakness in the comprehensive evaluation of control room instrumentation deficiencies with respect to emergency operating procedure implementation, emergency action level entry conditions, and lesser plant transient response capabilities. Concerns were raised regarding control room congestion, the lack of timely actions to return safety-related equipment to service, and the inappropriate authorization of documents which could bypass the procedure revision process. The Team expressed concern that these issues were not identified by the staff or through licensee program or management oversight functions.

3.2 Radiological Controls

Overall, Radiological Controls performance was observed to be good, with improvements noted over the last several years. Specifically, the licensee has achieved significant reductions in aggregate site exposure and the percentage of contaminated area. However, the Team observed inconsistent performance in ALARA planning, communications, supervisory effectiveness, and training (continuing training for transient technicians). Although clearly decreasing, the number of personnel contamination events remains above industry averages. Effective corrective action plans for the findings from self-assessments, audits, and this Team inspection are essential, and increased development of the source term reduction program is needed.

3.3 Maintenance and Surveillance

Performance in the areas of maintenance and surveillance was good and supported safe station operation. Craft personnel were knowledgeable and reflected proper safety perspectives. Staffing levels were adequate. High priority maintenance items were aggressively pursued. However, a large and slightly increasing backlog of lower priority corrective maintenance was noted. The quality and completeness of work packages was inconsistent, troubleshooting and post maintenance testing guidance were varied, and both appeared to be the result of a weak planning process. The licensee recently implemented personnel changes to address this issue. The quality of maintenance activities was very much dependent on the knowledge and experience of the staff. The Team expressed concern that the licensee did not have a program to evaluate the effect of permanently installed instrumentation found to be out of tolerance.

3.4 Engineering and Technical Support

Overall, engineering and technical support programs functioned effectively to support safe operations and modification activities at the station. The licensee established several significant initiatives to provide greater design control of modification activities. For example, the licensee is establishing a consistent set of "Common Nuclear Procedures" and a Modification Process Integration program, and is performing design basis document generation and configuration management and issues assessments. Modification Teams, which coordinate the interdisciplinary review of plant modifications, was a program strength. Modification acceptance testing was well controlled and adequately documented. Technical support and system engineering performance was inconsistent. Plant engineering personnel had been reorganized to better supervise system engineers and to better coordinate with corporate engineering. However, this caused some reassignments such that system engineers lacked specific experience and sustained system knowledge. An ambitious training matrix has been developed in response to this concern. To date, the use of performance monitoring data with respect to trending and analyzing has been limited. Site engineering is heavily burdened with the ongoing attempt to reduce a large nonconformance report backlog. However, the licensee has appropriately assessed and prioritized the backlog. Finally, the Team identified continuing weakness in the control of temporary plant alterations and temporary procedure changes.

3.5 Safety Assessment and Quality Verification

The assurance of quality at Peach Bottom was good. The basis for this conclusion was supported, in part, by the recent implementation of new programs to correct previous quality assurance weaknesses, such as the Experience Assessment Branch, the Nuclear Quality Assurance Task Team, the Peach Bottom self-assessment process, and the Corrective Action Program Task Force. The Team recognized that the initiatives had not been in progress sufficiently long to establish sustained effectiveness. The Nuclear Review Board and the Station Update Meetings were comprehensive in nature and favorably impressive. The first recently completed station-wide self-assessment initiative was positive. The assessment guidance was basic, and corrective action plan development remains to be accomplished. Similarly, the Event Investigation Program is a sound initiative to address the deficiencies in previous corrective action programs, but sustained performance remains to be demonstrated.

DETAILS

1 INTRODUCTION

1.1 Background

During the last several years, the licensee and the Nuclear Regulatory Commission (NRC) identified a series of program and personnel performance problems at Peach Bottom Atomic Power Station. In the most recent Systematic Assessment of Licensee Performance (SALP) Report issued in December 1991, the NRC noted that the licensee had initiated a series of comprehensive self-assessments that were effective in identifying program and personnel performance areas for improvement. The positive effects of some of these self-assessment efforts was offset by ineffective root cause analyses and weak implementation of corresponding corrective actions. Also, personnel error, procedure weakness, and lack of attention to detail continued to be persistent problems in the conduct of routine activities. As a result, the NRC found that licensee efforts to improve performance were slowed and that no consistent trend developed in the overall level of performance. On the basis of the results of this SALP, the NRC decided to review in more detail the functional areas of operations, radiation protection, maintenance and surveillance, engineering and technical support, and safety assessment and quality verification.

1.2 Scope

In order to provide NRC senior managers with a current assessment of performance at the Peach Bottom Atomic Power Station and to evaluate licensee effectiveness in resolving past weaknesses, an Integrated Performance Assessment Team was chartered to perform a broad based inspection of licensee performance in the five functional areas of operations, radiological controls, maintenance and surveillance, engineering and technical support, and safety assessment and quality verification. The Team compared the observed performance with that described in the most recent SALP. The Team employed performance-based inspection techniques, observing ongoing activities, and, as necessary, reviewing programs and procedures.

1.3 Methodology

The Team assessed the overall effectiveness of plant operations, radiological controls, maintenance and surveillance, engineering and technical support, and safety assessment and quality verification. The Team placed primary emphasis on observing in-plant, day-to-day activities.

1.3.1 Operations

The Team observed the activities of the operations staff in the control room and in the field and reviewed operator logs, clearance and tagging, surveillance testing, shift turnovers, and other practices. The Team interviewed individuals at all levels of the operations department and selected individuals who provided support to the operations department to assess their knowledge of responsibilities and their performance expectations. The Team attended various daily meetings to assess the interface between the operations and other departments.

1.3.2 Radiological Controls

The Team reviewed the organizational structure and staffing as well as the results of recent audits, monitoring, and the self-assessment initiative. The Team observed ongoing planned and emergent work activities to determine the effectiveness of and adherence to established controls. Emphasis of the observations was placed on the licensee incorporation of ALARA concepts and techniques into all aspects of plant operations, maintenance, and modification. Additionally, the Team reviewed long-term plans to improve performance such as the source term reduction program.

1.3.3 Maintenance and Surveillance

The Team observed ongoing field activities to determine the effectiveness of work controls, supervisory oversight, and craftsmanship quality. The Team reviewed work prioritization, planning, and scheduling to assess safety perspectives and to qualify backlog status and to assess the technical and administrative adequacy of the surveillance test program.

1.3.4 Engineering and Technical Support

The Team observed various aspects of the engineering programs, including design and modification engineering, system engineering, and engineering problems affecting plant operation. Specifically, the Team reviewed the quality of selected permanent and temporary plant modifications, the technical adequacy of dispositioned nonconformance reports, the effectiveness of corporate and system engineering interface with other station disciplines, and the scope of recent initiatives and programs established to improve engineering performance.

1.3.5 Safety Assessment and Quality Verification

The Team reviewed issue identification, tracking, and resolution processes, including the Event Investigation Program. Additionally, the Team evaluated onsite and offsite safety review committee performance and the effectiveness of the Quality Assurance program and the Independent Safety Engineering Group (ISEG). Finally, the Team conducted an assessment of the recent self-assessment initiative.

2 FINDINGS

2.1 Operations

The Team observed and evaluated the effectiveness of the operations department in the performance of various activities to assess levels of performance and the quality of intradepartmental and interdepartmental communication. The results of these performance assessments, along with related personnel interviews and documentation reviews were used to identify strengths and weaknesses in the conduct of operations. The Team also compared these results to the results of the recent Peach Bottom operations department self-assessment.

2.1.1 Performance Effectiveness

Based upon observations, interviews, and reviews, the Team determined that --

- The licensee complied with technical specification shift staffing requirements. Occasionally, an additional shift supervisor (SSV) was included on shift to support the control room SSV. This additional SSV usually handled the oversight of activities outside the control room, which relieved some of the administrative burden on the control room SSV. The licensee was in the process of hiring a number of potential reactor operator candidates in an attempt to increase the number of available licensed operators. The licensee also improved the career path guidance for non-licensed operators to facilitate entry into licensed operator training for qualified individuals.

- The control room operators and the plant operators were knowledgeable, professional, and attentive to their duties. Response to control room alarms was good. The technical assessment provided by the shift technical advisor (STA) to shift managers was a noted strength.

- Cognizance of plant activities by the control room staff was good. This cognizance was supported by good communications between the control room and personnel performing field activities.

- The shift turnover process ensured a thorough review and understanding of plant conditions. The control room turnover meeting for each shift was widely attended by representatives from the other onsite departments that routinely interface with operations and open communication was encouraged.

- Conduct of control room activities was typically controlled in an acceptable manner, with two specific exceptions. First, the Team occasionally observed excessive numbers of non-essential personnel in the controls area of the control room, many of whom had not obtained appropriate authorization for access. Second, many of these personnel could have hindered the operators' ability to monitor panels and manipulate controls. These issues were promptly addressed by the licensee during the inspection, but the initial observations were contrary to established performance standards.

- Controls ensured that the fire brigade composition was appropriate for each shift. Three of the five-member fire brigade positions were staffed from the operations department (usually the floor foreman and two other plant operators). The remaining two positions were staffed by qualified emergency medical technicians (EMTs) from the security department.

- The licensee made a concerted effort to ensure that plant labeling was accurate and legible. In the area of housekeeping, most of the plant was in good condition, however, certain areas were in need of further attention (specifically, the area under the diesel generators and some of the ECCS pump rooms). The Team noted no operability concerns.

- Shift log keeping was of acceptable quality. The Assistant Operations Superintendent has been routinely assessing the quality of operations logs since November 1991 in response to prior concerns about log content and quality.

- System configurations were adequately controlled during surveillance tests, system lineup verifications (checkoff lists), and clearance and tagging evolutions. The Team found one exception regarding independent verification following performance of a system operating (SO) procedure. (See Section 2.1.2)

- The implementation of the new clearance and tagging process through the Plant Information Monitoring System (PIMS) was a positive initiative.

2.1.2 Adequacy and Use of Procedures

Overall, the quality of existing procedures was acceptable and the procedures were used appropriately by the operations department staff. Established operator aids were good and were appropriately controlled by the shift technical advisors. However, the Team noted some procedural deficiencies as well as some activities which lacked needed procedural guidance. The Team also identified an issue related to instructions provided to the operators which were not appropriately handled through formal procedure change processes.

2.1.2.1 Procedure Deficiencies

An SO procedure that affected an air roll of the emergency diesel generator required manipulation of the normally locked open diesel lube oil booster block valves. The procedure provided no guidance for independent verification of valve position after return to standby readiness. The licensee noted that the requirement for independent verification of locked valves was prescribed in an administrative procedure (A-8), but acknowledged that the lack of guidance in the specific SO provided an additional challenge to the operator. In response, the licensee modified the specific SO procedure to include the independent verification requirement and is evaluating how to address this configuration control issue generically for SO procedures.

In general, alarm response cards (ARC) were not written per the established writers guide for specification of nomenclature. A Unit 2 ARC concerning core spray header differential pressure was not consistent with technical specification requirements for declaring the core spray system inoperable. The licensee changed the ARC and also performed an audit of other ARCs related to technical specification action statements and determined that no other conflicts with technical specification requirements existed.

2.1.2.2 Weak Procedural Guidance

The Team observed that the licensee had no procedure to control the transfer of the electro-hydraulic control (EHC) system pressure regulators. However, by the end of the inspection, the licensee had developed and approved a procedure to specify necessary operator actions. Similarly, the Team observed the licensee had no procedures for system filling and venting prior to system startup. The operations department specifically noted this as a weakness in the recent self-assessment. The scope and schedule for developing these procedures was yet to be developed.

2.1.2.3 Informal Application of Procedural Guidance

The Team found two instances in which procedural guidance was promulgated in an informal manner. A control room information tag provided operational instructions that were not similarly established by plant operating procedures. A night order entry was endorsed, which included information about the operation of the reactor building ventilation system, that should have been implemented through the temporary procedure change process.

2.1.3 Delay in Returning Emergency Service Water System to Service

The Team noted as a weakness an unnecessary delay in returning an out-of-service emergency service water (ESW) pump to service. Relay checks, a breaker modification, instrument preventive maintenance, and an oil change were completed on the "B" ESW pump, ahead of schedule, and the pump was turned over by the maintenance department to operations for clearance. Post maintenance testing and return of the pump to service was then delayed for approximately 2½ shifts. Due to resource limitations, shift managers determined that the upcoming day shift would be better staffed to remove the pump clearance and that this was acceptable, since the plant was only on the second day of a seven-day technical specification (TS) limiting condition for operation (LCO) action statement for the out-of-service pump. The Team acknowledged the increased workload on the particular off-hours shifts and the fact that the pump was returned to service within the seven-day LCO. However, the Team expressed concern that minimizing time within the LCO action statement did not receive a higher priority. The licensee indicated that this event will be reviewed and discussed during subsequent Shift Manager team building sessions.

2.1.4 Tagging and Control Room Deficiencies

The Team identified several issues related to tags attached to the controls and instrumentation within the control room and their potential to affect operator performance. While the recent operations department self-assessment identified the number of tags within the control room as a weakness, the Team was concerned that, other than assessing the effect on TS LCOs, control room out-of-service instrumentation was not routinely assessed for its overall effect on operator performance and prioritized for repair accordingly.

Included in the variety of tags attached to the control room controls and instrumentation were deficiency tags (yellow stickers) and clearance tags (red for danger, red/white for special conditions, and white for information). The Clearance and Tagging Manual (CTM), Revision 2, adequately addressed the control and use of the clearance tags; however, minimal procedural guidance existed for the use of the yellow deficiency tags.

The Team observed that the application of various tagging systems was not always consistent with established procedures, the guidance contained in the CTM or with verbal descriptions provided by the Instrumentation and Control (I&C) Supervisor. Specifically--

- yellow deficiency stickers - When a deficiency was identified in the plant that could affect the operation or indication of equipment controlled from the control room, Administrative Guideline (AG) 26.1," Equipment Trouble Tag (ETT) Initiation and Processing," Revision 0, provided for the application of a yellow tag to the remote equipment or the hardware in the control room. The tag reminded the operators that a significant problem existed with equipment in the plant. However, the Team noted instances where the system has been inappropriately used as a deficiency indicator and work order initiator for controls and instrumentation in the control room that are not functioning properly.

- red danger tags - The CTM defines the red tag for installation in clearance points that isolate equipment from sources of energy such that work may be performed. However, the team identified instances in which danger tags were inappropriately used to remind operators not to operate equipment or that equipment was permanently removed.

- red/white special clearance tags (SCT) - The CTM defines the SCT for isolating equipment from sources of energy in order to permit work. Authorized personnel may test or operate the equipment that is tagged while working under a clearance. However, the team noted instances where SCTs were inappropriately used to inform operators that equipment was degraded, but still available if needed.

- white information tag - The CTM states that the white tag does not isolate equipment, but provides information only as part of a clearance. However the Team noted that information tags were overly used and not part of a clearance, and used as an informal operator aid, which should be controlled by another program.

If a tagged component was related to a TS LCO, a high priority was set on the repair and return of the component to service prior to expiration of the LCO action statement. However, if the component was not LCO-related, the Team noted conditions that could potentially challenge operator ability to mitigate the consequences of abnormal plant or accident conditions. Specifically, the effect of inoperable equipment on operator ability to implement the emergency operating procedures (EOPs) had not been assessed by the licensee. On three occasions during the inspection, the Team identified the following inoperable instruments that directly affected the EOPs that the licensee had not comprehensively evaluated.

- Area Radiation Monitor 7.8 - This out-of-service indicator in the Unit 3 reactor building 195-ft fan room was referenced in Transient Response Implementation Procedures (TRIP) T-103, "Secondary Containment Control." The licensee promptly acted to return this instrument to service after the Team questioned the inoperability with respect to EOP implementation.

- Drywell Temperature Indication (TE-2501, point #127) - This Unit 2 temperature indication was referenced in TRIP procedure T-102, "Primary Containment Control." The instrument could not be returned to service because drywell entry was required to accomplish necessary repairs. Subsequent to the Team concern about the effect of instrument inoperability on EOP implementation, a management position was prepared by the operations department, and approved by the Plant Operations Review Committee (PORC), that explained how to interpret table DW/T-1 of T-102 that referenced the out-of-service instrument. The management position was required reading for all licensed operators. An operator aid was posted to clarify operator options with the instrument out-of-service. The Team found the corrective actions adequate until the instrument could be returned to service. The repair has been scheduled for the next entry into the drywell.

- Torus Pressure Indicator (PI-4953) - The TRIP procedures note that this Unit 2 indicator shall be used to determine torus pressure so that torus spray can be initiated before the torus reaches 9 psi. After questioning the shift management about the indicator, the Team determined that shift management was unaware that the indicator was out of service. The out-of-service tag was not affixed directly to the instrument (it was located slightly below the instrument). The tag was reattached directly to the instrument. The instrument will remain out-of-service until a new pressure transmitter is installed. The repair has been scheduled for the next refueling outage.

The combined effect of various inoperable pieces of equipment was not evaluated beyond TS applications. The total number of tagged instruments and controls appeared to be excessive, giving an impression of acceptance by the operations staff. While licensee efforts to resolve deficiencies and remove tags were noted, the backlog has remained relatively constant. Further interviews with operators revealed that the reason for the individual tags was not always known.

2.1.5 Training

The status of operations department training was good. Operations department management has dedicated a significant amount of time and resources to training and improving the operations and training interface. The licensee was giving particular attention to improving non-licensed operator training, on-the-job training (OJT) and on-the-job evaluation (OJE), and training for technical staff and managers.

In the summer of 1990, the Station Vice President commissioned a task force to perform a critical self-assessment of the training programs for licensed operators, non-licensed operators, shift technical advisors, shift managers, and the technical staff and managers. This task force was composed of representatives from Peach Bottom management, the technical staff, the training staff, and other plant departments.

The results of the self-assessment indicated that the programs for the licensed operators were well developed and effective and were strongly supported by operations management. However, the programs for the other areas had significant weaknesses such that problems that had been identified in earlier audits and assessments continued to exist.

Upon reviewing the results of the self-assessment and learning that many of the problems had been previously identified, the Vice President commissioned a second task force for a quality improvement evaluation and root-cause analysis. The root-cause of the recurring problems was determined to be a lack of line management involvement and their lack of ownership of their respective training programs. The contributing factors included --

- Ineffective communications between plant management and the training organization,
- Lack of line management knowledge of the training and accreditation processes,
- Training policies and expectations were not communicated to line management,
- Corrective actions were directed only to the training organizations, and
- Line management was not involved with resource allocation.

The licensee responded to these findings by initiating the following actions --

- Reassignment of personnel between training and the other affected departments,
- Establishment of a Station Training Council,
- Discussion of training issues at the daily leadership meeting,
- Integration of the training schedule contract,
- Establishment of line managers as adjunct faculty,
- Development of a continuing action plan, and
- Assignment of action items to specific line managers.

The Team determined that the licensee self-assessment and proposed actions were proactive. Based on the self-assessment findings reviewed by the Team, no further involvement by the NRC in operations department training issues is warranted at this time. The licensee intends to demonstrate a continuing commitment to improving the skills and abilities of the staff through sustained management sponsorship, continued commitment to enhancing the training curriculum, and continued improvements in the quality and effectiveness of the training programs.

2.1.6 Operations Self-Assessment

At the beginning of the inspection, operations department management presented the results of the recent self-assessment to the Team. The self-assessment findings were categorized as strengths, watch areas, or weaknesses. The Team assessed the validity of the operations self-assessment results on the basis of their observations during the inspection.

While the Team found the overall self-assessment results to be valid, it was difficult to determine what process management would establish for improvement efforts because; (1) the findings were quite general and (2) the licensee had not assigned priorities to the planned Corrective actions.

The Team concurred with noted strengths in the operations training area, career path improvement, plant labeling, and the contribution the unit coordinators made to the interface between the operations and maintenance departments. While the new PIMS was viewed as a positive initiative, the Team hesitated to categorize it as a strength in the operations area until initial implementation difficulties were ironed out, particularly in the clearance and tagging area.

The Team found that the operations department is already taking steps to address some of the watch areas identified by the self-assessment. In particular, hiring efforts are underway in an attempt to ultimately increase the total number of licensed operators. Also, the administrative procedure which controls the locked valve program (A-8) was being rewritten to correct the noted deficiencies.

Operations management appropriately identified the lack of system fill and vent procedures as a weakness and will request system engineering to develop these procedures. Out-of-service control room instrumentation was also a noted weakness but little additional detail was provided. While the licensee identified as a weakness the lack of availability of the Operations Superintendent and the Assistant Operations Superintendent, the Team also noted that the shift manager's administrative responsibilities often interfered with their managerial oversight function, particularly on day shift, due to administrative duties. The licensee acknowledged the Team observations and noted that an effort would be made to reassess shift manager activities and allotment of time.

Another weakness noted by the self-assessment was the communication of standards and expectations to all levels of the operations department staff. Overall, the Team observed that the operations department line personnel performed their functions in accordance with the performance standards established in the Operations Manual (OM) and Operations Management Manual (OMM). However, the Team found the licensee identification of this issue as a weakness to be appropriate due to the nature of some of the issues identified during the inspection. Several inspection issues (control room control problems, lack of assessment of effects of control room deficiencies, delay of ESW pump return to service, and inappropriate information in night orders) which were not identified by the licensee, were indicative of performance levels that were not in accordance with established standards and management expectations.

2.1.7 Conclusion

Performance in the operations area was acceptable. The reactor operators and shift supervisors were knowledgeable and attentive to the safe operation of the plant. The plant operators were well trained and professional. Control room command and control within the shift organization was acceptable with two specific exceptions regarding control room crowding and obstruction of the control panels by non-essential personnel. Cognizance of plant activities by the control room staff was good and was complemented by good communications between the control room and personnel performing field activities. Shift turnovers were comprehensive and ensured continuing awareness of plant status. The licensee has made a concerted effort to ensure that plant labeling is accurate and legible. In the housekeeping area, most of the plant was in good condition; however, certain areas needed further attention. The operations department was staffed in accordance with the TS requirements, and the licensee plans to increase the number of licensed operators on each shift. Controls ensured that fire brigade composition was appropriate for each shift. The technical assessment provided by the STA to shift managers was a notable strength.

While procedure quality was found to be acceptable and existing procedures were used appropriately, procedures are needed for system filling and venting. The licensee self-assessment recognized this need, but has not yet developed these procedures. The Team also noted that other plant information systems were sometimes used in place of procedures. In one case, procedural guidance was included on information tags in the control room. In another case, revised system operation was included in the night orders that should have been implemented through the temporary procedure change process.

Several control room controls and instrumentation deficiency issues were identified which could potentially challenge operator ability to mitigate the consequences of plant abnormal or accident conditions. In three notable instances, inoperable control room instruments that directly affected EOP performance had not been properly assessed. Another weakness involved delaying for almost three shifts, the return of an out-of-service Emergency Service Water (ESW) pump for administrative reasons.

Overall, line personnel were performing their functions in accordance with the performance standards established in the OM and OMM. However, the Team expressed concern that several issues identified during the inspection (inappropriate information in night orders, control room command and control problems, lack of assessment of effects of control room deficiencies, and delay of the ESW pump return to service), were indicative of performance levels that were not in accordance with established standards and management expectations and that were not identified by the staff or through licensee existing program or management oversight functions.

2.2 Radiological Controls

The Team reviewed selected aspects of the radiation protection program. Areas reviewed were as follows--

- Recent licensee initiatives,
- Organization and staffing,
- Audits and self-assessments,
- Radiation protection program performance, and
- Contamination of the auxiliary boiler.

2.2.1 Recent Licensee Initiatives

The Team reviewed recent licensee initiatives designed to enhance performance in the area of radiation protection. These efforts included station decontamination efforts, radwaste reduction efforts, personnel exposure reduction efforts, self-assessments, and supervisory training.

2.2.1.1 Findings

There has been a significant reduction in the percentage of the station that was contaminated (i.e., total contaminated square footage). Current levels were about 6% as of February 1992, as compared to about 37% in January 1988. The current levels compare very favorably to similar facilities. The Team noted that the licensee has also established short term goals to reduce hot spots throughout the station. Although a long-term plan remains to be established, the licensee has established a comprehensive cobalt reduction plan. The volume of radwaste stored at the site has been reduced by a factor of six since August 1987.

Although data was limited, personnel contamination rates appear to be decreasing when considering the work scope involved. For example, there were about 1200 personnel contaminations at the station in 1990 as compared to 804 personnel contaminations in 1991, even though the licensee performed two refueling outages and retubed condensers at each unit in 1991. Although an apparent reduction was noted, further reduction efforts are needed. There has also been a significant reduction in the three year average aggregate yearly exposure of personnel at the station. The average for 1989-1991 was about 322 person-rem as compared to an industry average of about 382 person-rem.

The Team noted that the licensee performed a self-assessment following the 1991 Unit 2 refueling outage and condenser tube replacement. The results of the self-assessment were used to plan and prepare for a comparable outage at Unit 3 in the fall of 1991. The Team considered this a positive initiative. The licensee also initiated enhanced self-assessments of the station's radiological controls program which is discussed in Section 2.2.3. In addition, the licensee has provided supervisory development for the majority of the supervisors in the radiation protection group.

2.2.1.2 Conclusion

The Team concluded that the licensee has been actively attempting to reduce the general radiological source term at the station and has provided for enhanced self-assessment capabilities. Additional efforts to reduce personnel contaminations appear warranted.

2.2.2 Organization and Staffing

The Team reviewed the organization and staffing of the on-site radiation protection group. The Team also reviewed the definition of responsibilities and authorities of various organization members and evaluated the effectiveness of the organization via performance-based observation of on-going work activities.

2.2.2.1 Findings

The Team reviewed an approved organization chart dated January 31, 1992, which clearly identified radiation protection work teams that were conceived by the licensee in early January 1992. Each work team is composed of a number of radiation protection technicians who report to a single supervisor. The work teams were developed to improve communications and morale, and improve the overall effectiveness of the organization. Technicians previously reported to one of several supervisors on any given day, which apparently contributed to past weaknesses in supervisory oversight and communication within the group. The work teams include shift teams that support on-going work activities during day shifts.

The licensee also found it necessary to improve supervisory oversight of the applied radiation protection group. An individual was assigned to the position of Applied Supervisor in December 1991. The Team found that although this individual was provided expectations, which included supervisory functions, the position was not identified on the organizational chart, and was not provided an approved position description. Further review by the Team identified that a clear description of responsibilities and authorities of personnel within the applied radiation protection group was not in-place, position descriptions were not current, and at least six professionals within the group did not have job position descriptions. The lack of clearly defined responsibilities and authorities was viewed as a program weakness. The licensee initiated action to revise and update organization charts and position descriptions, and to develop new position descriptions as necessary. These actions were completed satisfactorily prior to the conclusion of the inspection.

Although essentially all positions were filled within the radiation protection group, a licensee self-assessment identified that a base-level staffing number was needed. The licensee was pursuing this matter via their self-assessment program.

2.2.2.2 Conclusions

The Team identified clear efforts by the licensee to improve organizational effectiveness, morale, and communications within the radiation protection organization. Some improvements have been realized in these areas. However, the licensee needs to review the effectiveness of its radiation protection organization with regard to organizational development, alignment, staffing, responsibilities, and authorities. Recent organizational responsibility changes in the applied radiation protection organization do not appear to have been implemented in a fully effective manner. There remains a need to ensure that a clear understanding of personnel responsibilities and authorities is defined in order to realize significant improvement in performance and accountability.

2.2.3 Audits, Monitoring and Self-Assessments

The Team evaluated the adequacy of audits, monitoring and self-assessments of the radiation protection program.

2.2.3.1 Findings

Audits of the radiation protection program are performed by the Quality Assurance (QA) department. A separate group within QA, the Technical Monitoring Group, monitors on-going work activities. Another group within QA, Quality Support, performs reviews of procedures.

Team review of technical monitoring reports covering the past year indicated that they were performance-based and clearly identified strengths and weaknesses. An individual with health physics expertise and other technical monitors monitored various on-going work activities. The reports were considered to be of very good quality. However, due to the recent loss of the individual with radiation protection experience, there has been limited monitoring of radiation protection activities since October 1991. Individuals with limited health physics experience have been monitoring radiation program activities since that time. Nevertheless, the Team found that the corporate Performance Assessment Division performed assessments of health physics activities. These assessments more than supplemented the lack of technical monitoring performed by the QA group. These assessments were of excellent quality and served to reaffirm the findings of the technical monitoring reports.

The Team found that the licensee controls the audit program via a master audit plan (MAP). The MAP includes required frequency and audit scope. The licensee generates an essential elements document that provides a general outline of the area to be audited. A MAP was established for each important area to be audited.

Team review found that the licensee had recently (within the past year) significantly enhanced the quality and depth of audits of the radiation protection program. The Team found that the licensee performed a comprehensive audit (A0005475) of the radiation protection program during the period June 10-21, 1991, using an audit team of nine individuals with radiation protection expertise. The audit drew appropriate conclusions from the audit findings and required comprehensive corrective action for the root causes rather than focusing on individual audit findings. The overall finding of the audit identified a failure by line management to identify, correct, and prevent recurrences of several health physics program weaknesses such as procedural deficiencies and their implementation. It also identified problems involving a lack of effective field supervision to identify, correct, and prevent recurrence of improper radiation worker practices. The Team observed that the audit findings were elevated to senior management via issuance of management corrective action requests (MCARs) and that the licensee had initiated corrective actions to resolve the findings. The corrective actions were on-going at the time of this inspection. These corrective actions included increased supervisory oversight and development of work teams. The Team considered the audit to be a commendable initiative.

The Team found that audits of the training and qualification of plant services personnel (i.e., radiation protection, radwaste and chemistry personnel) over the past two years was limited. The QA group acknowledged completion of their audit in this area (MAP area C.2) even though the Team determined that only a few audit requirements identified in the MAP were completed. These omissions indicated a significant breakdown in the performance of the audit group. The licensee concurred with the Teams concern, issued a corrective action request, and initiated action to reperform the audit.

Subsequent review by the Team determined that this specific concern had been previously identified by the licensee during an audit of the QA program. A CAR had been issued on August 8, 1991, which concluded that requirements of procedure NQA-21, NQA Audits, were not implemented. As of the date of this inspection, all corrective actions outlined in the CAR were not complete, but NQA-21 had been revised in January 1992 to provide for improved audits.

The licensee recently performed a station-wide self-assessment with a portion of it aimed to identify weaknesses that may be hindering performance improvements in the plant services organization. Essentially, workers and supervisors met and identified strengths of the program and areas to be improved. Areas to be improved were then divided into weaknesses and "watch" areas, and further categorized into areas involving people, procedures or hardware.

The Nuclear Engineering Division in Chesterbrook, PA, also performed a self-assessment, using applicable industry supplied criteria. The assessment found weaknesses with efforts to reduce cobalt contamination at the station. The licensee developed an action plan to address the identified weaknesses.

The Team found that senior managers told the radiation protection supervisors that they were expected to spend more time in the field. However, the supervisors were not told what items they were to review. This was considered a weakness that could hamper identification of performance issues.

The Corporate Radiation Protection Group was supporting the site radiation protection organization, including assistance with the audit program, evaluation of whole body counts, performance of ALARA reviews for design changes, evaluation of personnel contamination concerns, and evaluation of exposure savings associated with zinc injection. Although support was provided, the Team determined that the corporate group initiated limited technical oversight of the program. The licensee's Radiation Protection Manual states that the Director of Radiation Control and Chemistry ensures that periodic evaluations of the radiation protection program are conducted both for compliance and performance expectations. However, no defined evaluation program was identified. Further, Section 9.22 of the Radiation Protection Manual states that the Radiation Control and Chemistry Section shall establish a program for providing technical assessments of all radiation protection activities. The program did not include verification of compliance, active involvement in review of program weaknesses, surveillance of work activities, and periodic assessments of program effectiveness. In addition, review of the corporate Radiation Control and Chemistry Section 1992 Business Plan did not identify specific goals related to periodic evaluations of the radiation protection program. Consequently, assessments performed by this section were primarily at the request of the station.

The Team also reviewed the radiological occurrence report (ROR) program and noted that the licensee performed a comprehensive evaluation of the RORs from 1991 to identify trends.

However, the licensee apparently had no ongoing review of RORs to identify short term trends needing interim corrective actions because the ROR procedure provided weak guidance in this area. For example in 1992, four RORs indicated that contaminated material was found in a clean area or that a challenge to a final contamination control boundary had occurred. The RORs for these events were not closed, but apparently were not being reviewed from a generic basis.

2.2.3.2 Conclusion

The Team concluded that the licensee had performed extensive performance-based audits of the radiation protection program and had identified numerous areas for improvement. It brought identified weaknesses to the attention of managers and initiated corrective actions. These efforts were commendable. It appeared that only within the past year had the licensee identified the full scope and understood the extent of program weaknesses and its implementation, and initiated meaningful efforts to correct their root causes. Licensee corrective actions for the weaknesses were continuing during the inspection and interim corrective actions appear to have improved performance. Licensee efforts were indicative of managerial efforts to enhance the effectiveness and implementation of the radiation protection program.

However, weaknesses continue to exist in QA oversight of the training and qualification of plant services personnel. The licensee needs to clearly define the review responsibilities of supervisors who perform plant tours and enhance independent oversight of the radiation protection program by the corporate radiological controls group.

Lastly, the licensee needs to formally develop an integrated corrective action plan, including milestones, to resolve the numerous areas for improvement identified by various audit and performance monitoring groups.

2.2.4 Radiation Protection Program Performance

The Team reviewed selected radiological work activities including inter- and intradepartmental communications, supervisory oversight, external and internal exposure controls, ALARA, radioactive material and contamination controls, and performance of independent radiation surveys to verify posting.

The Team reviewed work associated with desludging the radioactive waste collection tanks, replacement of incore instrumentation and a reactor water cleanup pump, and performance associated with cutting highly radioactive control rod blades. In selected areas, the performance reviewed spanned several years.

2.2.4.1 Findings

From the standpoint of radiological controls, the planning, preparation, and execution of work activities associated with the recent repair of Unit 2 incore instrumentation and the replacement of the Unit 2 reactor water clean-up pump indicated good efforts overall. The licensee effectively controlled contamination, minimized external and internal exposure, and ensured that workers had a good understanding of expected radiological conditions in the work areas. Tents and high efficiency ventilation systems were effectively used. The use of video tapes of the work area for training and briefing personnel assigned to replace the reactor water clean-up pump was commendable.

Team review of other work activities identified weaknesses in planning and control of work. For example, on February 24, 1992, the Team reviewed licensee efforts to desludge the floor Drain waste surge tank. The activity involved workers entering the tank and physically desludging the bottom of the tank with water and squeegees. The work was controlled by radiation work permit (RWP) #92-96, Revision 1 and was well planned from an industrial safety point of view. A detailed confined space entry permit was completed before personnel entered the tank. However, the Team determined that although no individual exceeded any exposure limits, work planning and inter- and intradepartmental communication concerning exposure control and ALARA planning were weak. This finding was based on the absence of extremity dosimetry and the poor techniques used to do the work. The Team made the following observations about the radiological control planning and preparation for this work--

- The RWP for the activity was wr out 2 weeks before the work. The radiation protection technician who wrote th. .rmit was unaware that personnel would be walking in radioactive sludge measuring up to 350 millirem per hour (mr/hr) on contact. Consequently, the technician did not review this matter and conservatively specify, for example, use of extremity dosimetry. The technician did not know that this work activity would be authorized at a later date.

- The technician that was assigned to the work activity assumed that the use of extremity dosimetry was previously reviewed and not required.

- The RWP specified to desludge the tank; however, the method of desludging or tools and equipment to be used was not specified.

- The radiation protection super r who signed the RWP was not aware that workers would be walking in sludge. He did question the need for extremity dosimetry but was tolD by the technician who wrote the RWP that it would not be necessary.

- The planning process did not identify this tank to be the first one in a recently initiated long-term preventive maintenance (PM) program for tanks at the station. Consequently the planning process did not evaluate the collective radiation exposure that would result from desludging all tanks over the life of the PM process. The work activity was not reviewed by the ALARA group, which precluded in-depth evaluation of all appropriate exposure reduction methods, including the use of state-of-the-art cleaning techniques o. design changes to tanks to provide for ease of future cleaning that would reduce aggregate exposure. Using workers to enter the tank and physically walk in contaminated sludge was a poor practice.

- All exposure associated with tank desludging was not incorporated into the initial ALARA review. For example, the installation of the filter was performed under a standing RWP. The filter clogged and resulted in additional personnel exposure. The Team determined, based on a discussion with the individual who directed installation of the filter, that the individual did not adequately review the potential for rapid clogging of the filter.

- Workers inside the tank hydro-lanced the drain to clear it. This work activity was not included in the original scope of the RWP.

- Team questioning of personnel indicated that the licensee contacted no other stations to identify state-of-the-art methods to perform the tank desludging.

In addition to the previous observations, the Team selectively reviewed the training of the radiation protection technician who entered the tank and performed the radiation surveys. The Team found that the technician did not know all procedure-specified criteria as to when extremity monitoring was required. This was important considering the fact that the workers walked in sludge with significant radiation dose-rate gradients (350 mr/hr to their feet and about 40-60 mr/hr to the whole body). Previously, on October 2, 1991, the licensee received an NRC violation associated with inadequate radiation surveys during work on highly radioactive components. The licensee responded to the violation in a letter dated October 31, 1991. The response indicated that procedures would be revised and included in required reading packages.

Subsequent Team review indicated that the licensee made a number of improvements to the radiation survey procedures as a result of the above violation and had included the revisions in required reading packages. However, the radiation protection technician who had entered the tank was away from the station when the required reading was issued. Discussions with the individual and review of training records indicated that the individual had not seen the revised procedures. Despite this, the individual was providing radiological oversight of significant radiological work activities without the benefit of the revised procedure guidance. This was a significant weakness.

Subsequent licensee review identified about 17 individuals who may not have reviewed procedure revisions because of short-term absences from the station. The licensee immediately initiated action to train the individuals on these procedures.

Another example of weakness in the planning and control of work was identified during cutting of highly radioactive control rod blades in the Unit 2 spent fuel pool. The licensee performed this work during the latter part of 1991. To review this activity, the team reviewed documentation and talked with personnel. The Technical Monitoring group observed the work and had brought identified performance deficiencies to the attention of radiation protection supervisors. Special approved procedures and RWP #2-91-05713 were used to control the work. The Team noted the following--

- The licensee revised the RWP on September 24, 1991, but about six individuals worked on the job without signing the revised RWP to indicate they had read, understood, and would comply with it. Subsequent review by the Team found that the controlling procedure 310, "Radiation Work Permit (RWP) Program", did not provide any requirements about workers signing revised RWPs. This was considered a program weakness.

- The licensee did not use underwater filters to accumulate control rod blade cutting fines for about two days. Workers on other elevations of the Unit 2 facility noted increases in radiation levels, which prompted a review. The filters were subsequently installed on the cutting apparatus.

It appears that the licensee had not implemented procedure requirements for installing filters for the initial work activity. The Team spoke with the supervisor who controlled the work activity and he indicated that he had not carefully read the procedure and did not see the requirement to use filters. As of March 9, 1992, this observation had not been detected by any licensee review of this activity.

The ALARA planning for the activity failed to consider collection and control of control rod blade cutting fines. The fines had a significant potential to impact ambient radiation levels in other systems and could have resulted in significant hot particle concerns.

The Team identified other radiation protection program weaknesses as follows--

- The Team identified a protective clothing change area on the 116-foot elevation of the Unit 3 turbine building that was in a high-noise area and was positioned in close proximity to a posted radiation area. An area a short distance away could have been used as a change area and was lower in dose rate and noise. The licensee radiation protection supervisors routinely walked by the area without considering this concern.

- The Superintendent of Outages or his representatives had not attended the past eight Station ALARA Committee (SAC) meetings spanning about a year. The Superintendent of Outages is a SAC member.

- The Team saw an operator exit the fourth floor administration building radiological control point on March 10, 1992, without properly surveying personal articles being removed from the radiological controlled area.

- The licensee appears to be using incorrect radioactive calibration sources to calibrate its beta monitoring equipment.

2.2.4.2 Conclusion

The Team concluded that the licensee had taken steps to improve the effectiveness of the radiation protection program. This was evidenced by very good performance demonstrated in the oversight and control of work associated with the replacement of a reactor water cleanup pump. However, performance is inconsistent as evidenced by the performance deficiencies noted during Team review of floor drain waste surge tank desludging and records of control rod blade cutting activities. The observations indicated that the licensee performs well on repetitive, clearly understood tasks, but weaknesses exist in the evaluation and control of first-time tasks.

2.2.5 Contamination of the Auxiliary Boiler

The Team reviewed the circumstances and licensee actions associated with identification of low-level iodine (I) 131 contamination of the "A" auxiliary boiler on February 24, 1992, with respect to criteria contained in IE Bulletin 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to the Environment," dated May 6, 1980.

2.2.5.1 Findings

The licensee identified the contamination during routine sampling of the boiler on February 24, 1992. The activity concentration was low. The boiler was isolated and shutdown in a timely manner. The licensee initiated an event investigation to identify the cause.

A similar occurrence had been identified on December 23, 1991, when both the "B" and "C" boilers had low-level I-131 contamination. At that time, the boilers were also isolate$, and the licensee performed a worst-case safety evaluation to determine possible off-site impact from postulated liquid or gaseous releases. The safety evaluation indicated no significant off-site impact would occur.

Another similar event had been identified on October 28, 1991 that time, the "B" auxiliary boiler was contaminated with I-131. The boiler was isolated and the contaminated liquid was drained to the radwaste system. An action request was generated to repair a series of three valves in the steam system to preclude recontamination of the boilers. Also, a memorandum based on evaluation of the probable causes of the event was sent from the Common Systems Branch Head to the Superintendent of Operations for distribution to operations Shift Managers. The memorandum provided proposed valve manipulations to preclude the boiler from drawing a vacuum, which contributed to it becoming contaminated. These actions constituted proposed corrective actions to preclude recurrence of the boiler contamination and a possible unmonitored release. Subsequent Team review indicated the following--

- The operations group rejected the memorandum that provided operating guidance because it was considered inappropriate; however, the system engineering group was unaware that operations had rejected the proposal.
- Although the leaking valves were scheduled to be repaired, someone below the superintendent level decided that the leaking valves would not be repaired.

Consequently, the licensee started-up the boilers after Unit 2 was returned to operation (December 19, 1991) without any apparent action to preclude recontaminating the boilers. IE Bulletin 80-10 states that if a nonradioactive system becomes contaminated, further use of the system shall be restricted until the cause of the contamination is corrected.

The Team further noted the following--

- The operations and system engineering groups had no subsequent communication about the memorandum, which indicated weak inter-departmental communication.
- Although the event investigation process approved the memorandum as a completed corrective action, no follow-up was conducted to determine if the instructions in the memorandum were actually implemented.
- Apparently the licensee did not conform to Section 4 of the Bulletin, which specifies requirements for control and monitoring of potential release points.

2.2.5.2 Conclusion

The Team concluded that weaknesses in communications and event investigation contributed to the failure to implement or provide comprehensive evaluation of corrective actions for auxiliary boiler contaminations. The licensee recognized weaknesses in this area and initiated a comprehensive review of all event investigations with outstanding long-term corrective actions to ensure immediate corrective actions were appropriate and properly implemented.

2.3 Maintenance and Surveillance

For the maintenance program, the Team evaluated how effectively the licensee planned and performed maintenance and evaluated the effectiveness of their troubleshooting and post-maintenance testing (PMT) processes. For the surveillance program, the Team evaluated how well the licensee scheduled, implemented, and oversaw the program as well as evaluated the quality of the surveillance test procedures.

2.3.1 Maintenance Program

The Maintenance Program had numerous administrative control procedures delineating expectations for maintenance organization function. However, some of these administrative control procedures were not up to date and were not being used by the maintenance organization even though the procedures had not been formally deleted from the active procedure index. For example, although the Maintenance Administrative Manual (MAM) contained approved and apparently active procedures describing the maintenance organization policy, very few licensee personnel knew the manual existed and those who did indicated that the manual was so far out of date that they would not use the procedures. Selected procedures from this manual had not been kept current. In addition, other plant procedures had not been revised to account for recent organizational changes. For example, procedures discussing the maintenance organization con'inued to discuss the Maintenance Engineer group, even though this group had been removed fro n the maintenance organization in January 1992. No plan presented to the Team provided evidence of how or when these procedures would be revised. The licensee did not list the outdated procedures as one of the major areas it identified in the recently completed self-assessment. The Team determined that the role of the MAM should be determined by the licensee and that administrative control procedures should be updated.

The predictive maintenance program, which consisted of vibration monitoring, thermography, motor-operated valve diagnostic testing (ie. MOVAT and VOTES), and lube oil analysis, was an excellent program overall. Through the predictive maintenance program, several improvements have occurred that have directly contributed to component reliability. The Reliability Centered Maintenance (RCM) Program is a strength to the maintenance area. Four systems have completed the RCM evaluation and, presently, evaluation of four additional systems are planned. At the conclusion of this inspection, the licensee had not completed developing its administrative procedures to ensure consistent RCM program implementation.

The licensee program for control of measuring and test equipment (M&TE) is described in Procedure A-138. The Team observed that the M&TE facility was adequately staffed and that the personnel review out-of-tolerance reports. Equipment overdue for calibration was effectively segregated from other test equipment. The calibration group established and maintained a calibration schedule for M&TE. However, the licensee did not have a program to evaluate the operational impact of permanently installed instrumentation found to be out of tolerance. This is a Team concern because certain plant instruments are used to verify operability of safety-related equipment during surveillance testing. The use or discovery of out-of-tolerance instrumentation directly affects the validity of associated surveillance tests and has the potential to mask degradation of performance or inoperability of safety-related systems. Additionally, Procedure A-138 references ANSI N45.2.8, in which Section 2.8.2 states that an evaluation shall be made when M&TE is found out of tolerance. Further licensee action with regard to this issue is warranted.

2.3.1.1 Planning Effectiveness

To support maintenance coordination activities, a unit coordinator (UC) was assigned for each unit, for the common systems, and for operations. The UC reviewed all action requests (ARs) for work identified in the previous twenty-four hours. The UCs screened the ARs for operational impact and priority. These ARs were presented to the Operations Shift Manager daily in an 8:00 a.m. meeting for approval. The UCs also scheduled planned testing and preventative maintenance. A detailed work schedule was prepared approximately five days in advance. System outages were planned via a rolling twelve week schedule to coordinate non-outage work on plant equipment. Maintenance planners typically developed the work packages about four weeks in advance of the scheduled system outage to allow for tagging preparation and package review by the line organization. The licensee processed high priority action requests into work orders in a timely manner resulting in the absence of a back log of this type of maintenance. These scheduling methods were effective in identifying and resolving high priority work and in maintaining an adequate plant material condition. However, a backlog of outstanding non-outage maintenance items existed and the trend was slowly increasing. This backlog presented a challenge to operators regarding out of service control room instrument action as described in Section 2.1.4 of this report.

The maintenance planners were responsible for developing the work order instructions, identifying the required parts, and assigning the post maintenance testing requirements. The Team reviewed a sample of work orders (WOs) and observed WO implementation in the field. The quality of WOs was inconsistent regarding work instruction detail and post maintenance testing (PMT). Some WOs incorporated, by reference, highly detailed instructions for activities such as pump and valve maintenance and electrical soldering. These WOs also included specific PMT requirements. However, other WOs contained general work instructions that authorized the technician to perform trouble-shooting and repair activities but provided little guidance on specific activities and restrictions. These WOs relied upon the skills of the technician/craftsman to implement the work. For example, the workers employed detailed guidance for troubleshooting a recirculation loop temperature indication problem but used general guidance to troubleshoot and repair a high pressure coolant injection (HPCI) system temperature indication. The licensee identified in discussion with the Team that improvements to the planning process were needed to enhance the quality and consistency of the work orders.

2.3.1.2 Implementation

The Team observed numerous work activities in both units. Most activities were well implemented. The Team determined that the craft personnel were knowledgeable and experienced. The workers exhibited good technical knowledge of the equipment being repaired and the tools being used. The Team observed that worker knowledge compensated for the general nature of certain work instructions and ensured that the activity was adequately completed. However, in one instance, workers believed that the as-found wiring condition of an excess flow check valve position indication was wrong. The workers did not seek engineering assistance or review controlled wiring drawings to determine the correct electrical configuration. Ultimately, the final wiring was restored to the as-found condition. This observation is an example where general work instructions contributed to a less than rigorous approach to maintenance. During another work activity, the craftsman did not perform all steps of the procedure in sequence because the procedure as written, was incorrect. Although the nature of the non-adherence was minor and the craftsman performed the work as intended, the individual did not stop and correct the procedural deficiency (as required) before completing the work.

In addition, the Team observed numerous delays in the accomplishment of work due to communication and coordination lapses between maintenance and support organizations. For example, the Team observed activities in accordance with WO C008406 that replaced the 2B Reactor Water Cleanup (RWCU) pump motor. The Team noted that the planning, pre-job briefings, and actual work activities were conducted competently and professionally. However, numerous delays were encountered by the organization in their interfacing with the Health Physics organization. This included lack of Health Physics support the first two times maintenance personnel attempted to walk down the tags for the work activity. Additional delays were caused by the Health Physics organization not properly updating computer status indicating that personnel had attended a pre-job ALARA briefing. Further delays were caused when the required dosimetry was not at the access control point. The Team noted that the maintenance personnel felt these types of delays were not uncommon, and affected the amount of work that was able to be accomplished. Supervisory involvement in field activities varied, with greater instrument and controls branch supervisory presence observed by the Team. Overall, maintenance practices were generally good with the exception of the inconsistencies and inefficiencies noted above.

2.3.1.3 Troubleshooting and Post Maintenance Testing (PMT)

The licensee self-assessment identified that troubleshooting was a weakness, and administrative controls were revised to address this weakness in the near term. Nonetheless, the Team found that these changes in administrative controls for troubleshooting did not appear to be well known by I&C technicians and their first line supervisors. Specifically, the Team observed that I&C technicians sent to perform troubleshooting activities were unaware of the changes in administrative controls.

The Team noted that the guidance for post maintenance testing (PMT) was not effectively implemented. Procedure MG-8.1-1, "Post Maintenance Testing," provided guidance to planners for determining and documenting PMT. The Team observed that forms for documenting the PMT requirements and results were not being used. The Team noted that the PMT criteria identified in some WOs were vague or general and without specific acceptance criteria. The PMT documentation for some WOs was also general in nature. Additionally, the assignment of PMT to one WO had the potential of not being sufficient for the scope of the work authorized. Specifically, a WO authorized rework including the disassembly of a vacuum breaker valve on a main steam line relief valve but the required PMT was limited to checking the position indication. The Team ascertained that the scope of the actual work performed was limited to the position indication and thus the PMT was adequate. The Team also acknowledges that operations shift management is required to review completed work and PMT adequacy but views this as a backup feature in the program that should not Be routinely challenged. While the Team found no instances of inadequate PMT, the Team concluded that PMT implementation was weak and needed improvement. The Team concluded that the problems and potential shortfalls in the PMT process indicate that the guidance was not effectively implemented. Licensee management noted that expectations had recently been raised regarding work package quality including PMT, and that personnel changes had been instituted such that these higher expectations can be met.

2.3.2 Surveillance Test Program

A Surveillance Test Coordinator administered the surveillance test program. This program has received increased manager attention due to past problems with the control of the program. These problems have included numerous missed surveillance tests. However, due to the recent attention given to the program, no surveillance test requirements have been missed in the past six months. In addition, the licensee is presently in the process of shifting the computer data base program for scheduling and controlling testing to the site-wide PIMS system.

2.3.2.1 Procedure Quality

Numerous surveillance test procedures were reviewed as the tests were being performed in the field, or as work packages were being reviewed. Most test procedures were technically adequate for the test requirements. However, the Team identified two Surveillance Tests which had inadequacies. First, Surveillance Test ST 9.9, Revision 7, "Liquid Nitrogen Quantity Report-CAD Tank," was written to address the surveillance requirements for both Technical Specification 4.7.A.6.b and 4.7.E.3.a. However the test procedure did not state that surveillance requirement 4.7.E.3.a was being addressed by the test. In addition, the Team questioned if the surveillance procedure adequately addressed required actions if the containment atmosphere dilution (CAD) tank was found below 2500 gallons. The licensee made changes to the procedure, and other plant procedures which addressed the Team concerns, and stated that a Technical Specification change request currently in the review cycle would be submitted to clarify the requirements for the Safety Grade Instrument Gas (SGIG) system. The licensee also reviewed past surveillances to assure that the plant had not operated with less than 2500 gallons in the CAD tank when the volume was required by the Technical Specifications. The second surveillance test with potential inadequacies noted was the calibration procedure for the HPCI steam line temperature detectors, SISIT-23-5943-DICO "Calibration Check of HPCI Steam Line Area Temperature instruments TE/TSD 5943D." The resistance values given in steps 6.2.3.2 b & c appear to be too high for the type of RTD now installed (PYCO). When this resistance is converted to temperature, the temperature is 2 degrees F higher than the Technical Specification limit of 200 degrees F. The licensee acknowledged the Team's concern and agreed to review and revise the procedure as appropriate.

Near the end of the inspection period, the licensee identified test inadequacies in a logic system functional test (LSFT) that would have prevented a valid signal from isolating the group III Primary Containment Isolation System (PCIS). The licensee had determined that the inadequate test had been run at least once on each unit when PCIS was required to be operable. The licensee was addressing this issue at the end of the inspection.

Based on the sample of surveillance tests reviewed, the Team concluded that overall the procedures were adequate with some room for improvement.

2.3.2.2 Implementation and Review

The quality of the in-field surveillance activities observed was good. The testing activities were well planned and the procedures followed. When instrumentation was found out of tolerances, the instrumentation was adjusted prior to returning it to service.

The licensee process for reviewing and approving completed surveillance tests and results was adequate. The licensee had determined that the review process was prolonged with numerous tests presently out for review for greater than thirty days. Licensee management had requested that a performance indicator be developed which indicated how many tests were out for post-test review for greater than thirty days. The first graph developed indicated that 104 tests were presently in this category. Appropriate management attention appeared to be given to this issue.

although it appeared that management attention would now have to be redirected toward reducing the backlog of test reviews.

2.3.3 Conclusion

The Team concluded that the maintenance organization is properly supporting the safe operation of the station. The recently conducted self-assessment indicated that the licensee is able to determine what weaknesses exist in the organization. The Team determined it to be critical that management develop a timely corrective action plan to address the identified weaknesses, and to establish necessary compensatory actions for weaknesses requiring near-term attention. Additionally, the Team concluded management attention is warranted to review maintenance organization administrative procedures to determine applicability, and revise or delete procedures as appropriate to ensure program description is consistent with management direction and expectations. In addition, the lack of a process to evaluate installed instrumentation found to be out of tolerance is a Team concern that merits further licensee actions.

2.4 Engineering and Technical Support

The Technical Section and the corporate Nuclear Engineering Division (NED) share the engineering and technical support function for Peach Bottom. The Technical Section is located at Peach Bottom and the NED is located in Chesterbrook, Pennsylvania, about 1½ hours from the site. In addition, a site engineering section of NED is located at Peach Bottom to provide daily contact between the station staff and corporate NED. The Technical Section is staffed with system engineers who provide day-to-day plant engineering support. The NED provides traditional corporate engineering functions such as modifications.

2.4.1 Nuclear Engineering Division

2.4.1.1 Engineering Support Activities

The Team found NED support of plant issues to be good with an appropriate allocation of engineering resources in evidence. NED capital resources are evenly distributed between both PECo nuclear sites with a larger share of operating manhours allocated to Peach Bottom. This is consistent with the work requirements observed by the Team since the emergent workload (e.g., nonconformances and engineering work requests) is greater at Peach Bottom than at the Limerick site.

Management of engineering resources was viewed by the Team to be well directed. NED management defines the division expectations by establishing goals and disseminating them to lower organizational levels. Work priorities are determined consistent with station needs and a system to monitor workload is in place. This system provides management with a basis for the proper control of emergent work and for priority change discussions with station management. The Team reviewed the resource loaded schedule for the Mechanical Systems Section, which was typical of the NED organization in general. The Team noted that existing schedular controls define work to be done by each engineer, but do not measure the amount of work completed for [illegible] ls. This is a disadvantage when establishing priorities since the real available manhours to address new emerging work are not well defined. Partly because of this limitation, engineering efficiency (comparison of the percentage of work completed to the percentage of manhours expended) cannot be monitored well. Evidence of this observation was identified in an NED self-assessment. While a definite plan for improvement has not yet been formulated, the Team found this efficiency limitation to have no direct adverse impact upon the observed engineering support work.

Formal communication between NED and site management takes place in weekly conference phone conversations and in a monthly meeting at the station. Minutes of the monthly meetings are published and subjects are formally tracked through closure. Lower level communications occur daily, as required, and when site engineering personnel attend station meetings.

Certain engineering activities were inspected by the Team and found to be supportive of existing plant needs. The Team evaluated the following engineering support work in this regard: emergency diesel generator reliability and torus water clean-up, improved configuration for the reactor vessel drain, cable bend radius limits, reactor feed pump and recirculating pump repairs, recommendations for cathodic protection, guidance for predictive maintenance, design basis reconstitution, and improvement of the plant "Q" list.

A Site Engineering Section of NED is located at Peach Bottom and provides an engineering presence and responsiveness to plant issues. This group has the primary responsibility of responding to plant issues resulting from nonconformance reports (NCRs), Engineering Work Requests (EWRs), and Engineering Change Requests (ECRs). Some modification design activities, constituting work of a minor design change scope, are performed. The Team found that site engineering personnel work on approximately 30% of the total number engineering requests due to manpower limitations and the need for additional technical expertise, but do provide an initial screening prior to passing other items to NED in Chesterbrook. Engineering work backlogs exist and resources are expended in evaluating priorities. While the Team found that this may limit the full effectiveness of the site engineering staff, proper priorities are established by plant personnel and conflicts with NED priorities are negotiated based upon station significance. Also, controls are in place to ensure visibility of current and overdue work, through internal NED performance indicators and reports which are distributed throughout senior levels of management.

2.4.1.2 Engineering Disposition/Coordination

The Team inspected the technical adequacy of the work performed by the Site Engineering Section. Modification work, NCRs, and EWRs, including the technical disposition of nonconforming conditions and other engineering work requests and modification work activities, were reviewed and evaluated to form the basis for the assessment that acceptable design controls related to these processes are in evidence.

Engineering control of the modifications process is defined in procedure NEDP 3.1. The Team found the process to be well structured with formal requirements for design modification preparation, review, and implementation. Three modification documentation packages were reviewed for both compliance to procedural requirements and technical adequacy. All packages contained appropriate design inputs and calculations appeared technically adequate. With regard to the reviewed 10 CFR 50.59 evaluations, the Team concurred with the determination that no alterations to the updated FSAR were required and that all safety questions had been reviewed. System walkdowns were performed where necessary per NEDP 3.1 and the supporting documents required by procedure were available for review. Additionally, four Engineering Work Requests were reviewed for completeness and technical content and were found by the Team to be acceptable.

Fifteen NCR dispositions were also reviewed by the Team to assess the quality of the technical determinations documented therein and were found to be acceptable. Data used to support the disposition of two selected NCRs were further evaluated. Information used to properly disposition NCR 92007 was assessed as satisfactory, but the method for developing a weld procedure used in the work governed by NCR 91492 required further technical review. The Team identified that non-ASME, safety related items can be welded using procedures that are not qualified by test welds. This technical judgement was questioned by the Team, as were the adequacy of the system of overall controls for welding on non-ASME safety related items. As followup, the Team interviewed personnel responsible for providing the welders with instructions and concluded that craftsmen had received the appropriate directions primarily because of acceptable past work practice and worker experience, rather than due to good procedural guidance. Also, the Team found that NED assumes the responsibility to classify items as safety related while another division (Nuclear Maintenance) defines the welding requirements for those items. Furthermore, the Team identified no systematic requirement to reconcile maintenance department technical judgements regarding welding controls with the NED group definition of safety significance. Presently, the Nuclear Maintenance Division is revising the welding program and the welding engineering group is evaluating the incorporation of changes which will provide appropriate guidance in this area. The Team determined that such action to improve welding controls and clarify test weld requirements for non-ASME safety related items was prudent, despite the fact that no hardware deficiency had resulted from the identified existing program weakness.

2.4.1.3 Contractor Control

NED uses contractors to augment their staff to perform a variety of tasks including studies and modification design. The procedural control of contractors was assessed by the Team to be a programmatic strength. The licensee issued an interface specification, NE-088, in 1991 which defined the NED quality, cost, and schedule expectations for contractors. One particular provision of the program is the formalization of a contractor performance review process, which was evaluated by the Team as a positive development. Contractor performance records are kept and new work can be allocated based upon performance.

2.4.1.4 Improvement Efforts

The Team found NED improvement initiatives to be good. NED performed a self-assessment in 1991 and has developed a program of corrective actions. The Team which found that the appropriate guidelines were used in the self-assessment and that the results were issued to Section Managers and Branch Heads in October of 1991 for review with their staffs. Several improvement actions resulting from the self-assessment were verified as being completed. This demonstrated the NED commitment to improvement in areas where such corrective measures were found to be warranted.

2.4.2 Technical Section

The Technical Section was reorganized in mid-January, 1992. The objective of the reorganization was to align the site staff with corporate NED and to transfer remaining technical engineering support functions from the Maintenance/I&C organization. As a result of the reorganization, four positions were lost from the Technical Section and 21 positions were added from the Maintenance/I&C organization.

2.4.2.1 System Engineer Responsibilities

The Technical Section staff currently consists of approximately 120 persons with 75 of them assigned as system engineers, program specialists, or project specialists. The Technical Section is divided into eight branches with, in each case, a Branch Head representing the sole supervisor between the system engineers and the Superintendent of the Technical Section. Approximately 22 individuals are contractors, but they are in temporary positions working on special assignments.

The system engineer function at Peach Bottom is defined in Administrative Guide (AG) 38, "System Engineer's Role and Responsibilities," Revision 4. This revision reflects current management philosophy that system engineers are system managers and will soon no longer be surveilling or manipulating valves on their systems as was the practice in the past. The system engineer will manage the system, establish priorities, and provide direction to others to work to these priorities. AG-38 provides much useful information concerning the expected duties for system engineers, such as frequency of performing system walkdowns, trending system performance, maintaining system notebooks, supporting modifications, and documenting system turnovers between system engineers. Procedure AG-61, "Plant Performance Monitoring Program (PPMP)," and AG-62, "PPMP Guide for Program Implementation, Data Acquisition, Trending and Analysis," provide information on trending system and component performance as part of the system engineer's responsibilities delineated in AG-38.

The Team found that the system engineers average approximately eight years of professional work experience. However, experience as a system engineer averaged only three years, and in January most of the system engineers were assigned new systems as part of the reorganization. Nonetheless, almost all of the former system engineers are still in the Technical Section assisting each other with their former systems. The recently created system engineer turnover process was working effectively. Several reportable issues were found as a direct result of the turnover process and included the discovery of two conditions that had to be analyzed and corrected because they placed the plant outside its design basis.

The Team interviewed several system engineers and Branch Heads. The Team determined that the system engineers were aware of new management expectations for their position. However, system engineer knowledge of specific requirements delineated in AG-38, AG-61, and AG-62 varied. Some system engineers were not aware that AG-38 had been recently revised, what the frequency of system walkdowns were, what items would be appropriate to trend on their particular system, and how they would set system priorities and interface with other members of the station organization to achieve these priorities. Some Branch Heads were not aware of certain requirements delineated in AG-38, such as frequency of system walkdowns and the system walkdown checklist attached to AG-38. In addition, some Branch Heads stated that they probably do not spend enough time in the plant; there were no goals established. The Team viewed the lack of technical section awareness of certain guidance and requirements as somewhat of a management weakness in disseminating the expectations of total program knowledge and objectives to the staff.

The Team also spoke with the Plant Performance Monitoring Program (PPMP) Coordinator. The Team found that many system engineers were recording data, but effective trending varied between system engineers and would probably not produce meaningful conclusions. A recent licensee self-assessment found this area to be a weakness. The PPMP Coordinator is currently working on a computer program database and software package that would produce meaningful system performance information. The Team viewed this enhancement as a positive initiative, but determined that the revised PPMP may not produce totally effective results until early next year.

2.4.2.2 System Engineer Training

The Team reviewed system engineer training and found it to be thorough. Training available for system engineers consists of five separate courses. The BWR Fundamentals course is 4 weeks in length and covers thermodynamics, reactor theory, and all aspects of BWR systems. The Technical Staff Training course is 6 weeks in length and covers areas such as print reading, electrical, mechanical and civil engineering fundamentals, Peach Bottom programs, NRC functions and requirements, and process control. The majority of the system engineers have attended both of these courses, and the remaining system engineers are scheduled to complete the training in 1992.

The I&C Process Lab course is 1 week in length and covers areas such as fundamentals of measurement, process controls and transmitters, and also [illegible]des 50% laboratory work. Almost half of the system engineers have taken the course; the re[illegible]ing system engineers are scheduled to attend in 1992. The System Engineer Training course is 4 weeks in length and covers areas such as personal effectiveness, technical writing, modification Team training, system characteristics, Probabilistic Risk Assessment, and the Human Performance Evaluation System. Most system engineers have not attended this course, but six individuals are scheduled to attend in 1992. Six people in the Technical Section have attended the Certification course. This 13-week course is structured like an SRO licensing class and consists of simulator and classroom training. A Certification course is not currently scheduled for 1992. Overall, the Team assessed the system engineer training process to be a program strength.

2.4.2.3 Shift System Engineer

A recent licensee initiative was the placement of a system engineer on-shift. Six former system engineers are on a five shift rotation and work with the operating crews on an around-the-clock basis; they report to the Reactor Engineering Branch Head of the Technical Section. The shift system engineers assist operators with operability determinations, troubleshooting, and system walkdowns. They also perform special operations-type projects for the Technical Section. Licensee management believes that the shift system engineers will enable the Technical Section to be better informed of operational events or occurrences, especially those that occur during off-normal hours. Similarly, operations personnel will have a dedicated off-hour contact to assist with system problems that develop. The Team assessed the on-shift system engineer initiative to be a positive development with the potential for improved interfaces and information transfer with the operations staff.

2.4.2.4 Response to Technical Issues

The Team reviewed Technical Section response to the following activities:

- Evaluation of the E-3 diesel generator speed decrease,
- Search for a Unit 2 battery ground caused by excess flow check valves,
- Plans to cope with the Unit 2 RHR "B" loop pressurization,
- Resolution of the Unit 2 and 3 RCIC system ASCO solenoid valve maximum operating pressure differential (MOPD) concern, and
- Correction of the Unit 2 "B" RHR heat exchanger flange leak.

Overall, Technical Section performance on these issues was good. Once the Technical Section became aware of these issues, system engineer and Branch Head response was timely and evident. However, the Team observed some confusion amongst Technical Section personnel with regard to the RCIC system ASCO MOPD concern. Technical Section personnel questioned the MOPD value that had been selected to determine ASCO valve operability. Rather than declare the primary containment isolation valves inoperable, block them closed, and write an NCR for corporate NED to evaluate, licensee personnel spent time discussing the validity of the MOPD value. Eventually, appropriate actions were taken in accordance with the Technical Specifications within the allotted time period.

2.4.3 Modification Controls

The Team reviewed and evaluated the NED program and procedures used to define and control plant modifications which constitute design change activities. NED procedure, NEDP 3.1 with interim guidance IG-3.1-13, provides an overview of the modification process, excluding specific limited scope activities (e.g., design equivalent changes and temporary modifications discussed separately in sections 2.4.3.4 and 5 below.) The Team noted as programmatic strengths the planned and organized use of licensee modification teams to coordinate the interdisciplinary review of plant modifications and the performance of multiple plant walkdowns to prepare preliminary designs and assess constructability, plant conditions, and other criteria in the final design process.

The Team inspected the design packages for four completed or partially installed plant modifications, two each prepared separately under the purview of the NED corporate and site engineering staffs. Cognizant engineering personnel were interviewed with respect to design criteria, design input document (DID) controls, engineering work scope authorization, references to existing specifications and committed codes, modification acceptance testing (MAT), and revisions to design change affected documents.

2.4.3.1 Design Input/Work Control Interfaces

The Team noted that certain modifications (e.g., Mod No. 5146) involve installation periods that may extend over more than one operating cycle. Therefore, revisions of other documents referenced by the design change would require re-evaluation of the DIDs to allow installation to proceed in accordance with any similarly revised installation provisions. Discussions with site engineering personnel confirmed that all deviations from referenced specifications must be documented in revised DIDs or the original specification criteria still govern all modification work. While the inspection identified no cases where revised DID requirements had been inappropriately handled, the Team noted that the multitude of updated, original construction specifications, along with the newer nuclear engineering specifications, provide an environment where referenced design input data must be precisely controlled to avoid installation deviations.

Likewise, the number of different modification, new construction, and maintenance work procedures and guidance documents contribute to a complicated environment for work control and provide the potential for installation error relative to the consistent application of the governing design provisions. For example, a maintenance guideline, MAG-C-301, used by the plant maintenance staff in controlling the bolting and torquing of safety-related mechanical joints provides installation details somewhat different from the specification criteria (reference: NE-004) governing pipe flange torque requirements.

Further, the installation procedure, IP 5.2, issued by the Nuclear Engineering and Services Department (NESD) for the control of contractor pipe installation work provides guidelines for bolt torquing which differ from the MAG-C-301 details, but which are consistent with specification NE-004, which is not listed as a referenced document in IP 5.2. While the Team determined that the noted differences do not adversely impact the acceptability of the final installed piping connections, these inconsistencies, complicated by the multiple specification references, represent examples where design/work interfaces are not as positively controlled to preclude installation errors, as is possible. Licensee recognition of this potential area of weakness is reflected in the NESD initiative to eliminate or consolidate the contractor installation procedures and eventually establish a consistent set of "Common Nuclear Procedures."

2.4.3.2 Design Output/Document Revision Controls

For the four modifications selectively reviewed by the Team, design change details were evaluated with respect to referenced codes, standards, and FSAR commitments, where applicable, and affected documents were examined for the appropriate revision. Where code piping installations were involved, the team inspected the modification packages for compliance with applicable ASME Section XI and Section III or ANSI B31.1 requirements. The Team examined each 10 CFR 50.59 review determination and any applicable safety evaluations. Modification document control and review forms and nonconformance reports, as applicable, were reviewed to confirm the adequacy of the drawing revision control and affected document update process.

Relative to Modification 5258, which affected condensate storage tank level instrumentation, the Team identified that Alarm Response Cards had not been updated to reflect the correct type of instrument installation (reference: NCR P-90737) and operator training documents had not been revised to indicate the correct tank volumes associated with the setpoint data revised by the modification. Also, with respect to Modification 1498, the Team evaluated the correctness of an affected HPCI piping and instrumentation drawing and isometric drawing information. This modification governs the replacement of specific testable check valves of a tilting disc type with swing check valves that provide precise valve position indication and permit full stroke testing. With respect to the actual design details, new testable HPCI check valve, AO-18, was procured and installed to ASME Section III criteria, while the drawings reflected only the original ANSI B31.1 design criteria. The Plant Information Management System (PIMS) data sheet for valve AO-18 indicates design and installation of the valve to the correct ASME Section III addenda. In this case, the Team identified no technical problems with the Modification 1498 design or implementation, but questioned the decision to not annotate the piping drawings with a note reflecting the revised installation criteria.

Overall, the design packages, to include both design input and affected document revisions, for the modifications reviewed by the Team appeared to be well defined and appropriately controlled. In response to specific Team questions, the licensee discussed the NED Modification Process Integration (MPI) program initiative which is intended to address the long range control of support drawing and specification revision level controls. The Team viewed this initiative as a positive indication of NED plans to strengthen and improve the existing plant modification process.

2.4.3.3 Modification Testing

The Team reviewed procedure A-89 that delineates the requirements for modification acceptance tests (MATs). A sample of plant modifications was examined to not only check compliance with procedural controls for the conduct of MATs, but also to evaluate MAT substance and acceptance criteria relative to the function of the design change. The Team confirmed engineering involvement in the technical content of MATs, along with Plant Operations Review Committee (PORC) review and approval of the proposed testing conduct.

The Team noted that for Modification 1498 discussed above, certain flow testing was conducted on the Unit 2 modification, but was waived as part of the Unit 3 MAT. The basis for the test waiver was documented in a revision to the Engineering Work Letter (EWL) for this modification. The Team examined the applicable MATs for Unit 3 and verified consideration of the revised EWL criteria and evaluated the NED justification for the flow test deletion.

While appropriate review and approval authority for the deletion of flow testing on the Unit 3 installation was confirmed, the Unit 3 MAT demonstrated that the modification met all design specifications (i.e., an A-89 procedural requirement) only by referral to the revision of the EWL; instead of documenting a review and analysis of the Unit 2 injection flow test results and their applicability to Unit 3. However, other than this one case where MAT documentation could have been better clarified, the Team found the overall modification acceptance testing program to be well controlled and adequately documented. The MATs reviewed by the Team generally provided evidence that the modification, as installed, met the appropriate design specifications and criteria.

2.4.3.4 Design Equivalent Change Program

The Team reviewed the licensee program for engineering control of structure, system, or component replacements where the new items are considered equivalent, but not identical, to the original items. The Design Equivalent Change Control procedure NA-10P005, establishes the process for evaluating proposed plant changes and ensuring that alternate replacement items, if handled as a design equivalent change (DEC), have been verified to be capable of performing design basis functions. The Team noted that the use of DECs is intended to cover plant changes which do not involve significant engineering resources and which should be essentially "transparent" to plant operational activities. Neither identical replacement items, nor plant modifications qualify for processing as DECs, and procedure NA-10P005 requires conduct of a Replacement Part Equivalency Evaluation (RPE) to confirm design conformance.

The Team interviewed cognizant NED site engineering staff personnel regarding the responsibilities of different station departments regarding the processing of DECs. While the station Procurement Engineering Group (PEG) maintains the responsibility for conducting an RPE and performing a 10 CFR 50.59 safety determination for replacement activities, the site engineering staff receives all completed RPEs, along with an Engineering Change Request (ECR) describing the proposed plant change. NED site engineering personnel review the ECR for technical accuracy, evaluate the 10 CFR 50.59 determination to confirm the acceptability of handling the change as a DEC and not a plant modification, and identify affected engineering documents. The Team verified that site engineering personnel also review the RPEs performed by PEG, although the DEC procedure does not specify such review as an NED program responsibility.

The Team examined a sample of completed ECR files, checked for acceptable programmatic controls, evaluated the engineering disposition of each component replacement, and assessed the overall adequacy of the DEC process. The Team reviewed the engineering evaluations, safety reviews, and procurement classifications, checking for the appropriate consideration of environmental qualification, fire protection, structural criteria, nonconformance report references, and vendor documentation, as applicable. Specifically, with regard to one sampled ECR, the Team noted that the engineering evaluation considered "worst case" plant applications; thus allowing the requested component replacements to be used generically for similar future equipment substitutions. The Team confirmed the acceptability of procedural controls governing such generic component replacement activities.

Overall, the Team found the licensee program for processing Design Equivalent Changes to be adequately controlled and properly implemented. The controls for review and approval of such plant changes by the design authority are procedurally defined and provide an effective process for component replacement, while ensuring compliance with design basis requirements.

2.4.3.5 Temporary Plant Alteration and Temporary Procedure Change Controls

The procedures governing the process for controlling temporary modifications is Administrative Procedure A-42, "Control of Temporary Plant Alterations," Revision 17, and AG-77, "Implementation of TPAs," Revision 1. The Team reviewed several TPAs on Units 2 and 3 and walked-down plant systems to determine if any unauthorized TPAs existed. The Team found that proper reviews and approvals were complete, 10 CFR 50.59 reviews and safety evaluations were done if necessary, and extensions were granted in accordance with procedure A-42.

However, several weaknesses were found with the TPA process. The number of TPAs were excessive with quite a few installed for extended periods. The total number of TPAs for both units was 62, with about one-third greater than a year old. Procedure A-42 does not place a limit on the length of time that a TPA can be installed, but the procedure calls for PORC re-review of all TPAs that remain installed beyond their estimated removal date. In addition, the Plant Manager reviews and approves TPAs that are extended for the second and subsequent times. Apparently, these controls have not been effective in reducing the number of long-standing TPAs.

Procedure A-42 also requires the Document Control Center to stamp controlled drawings that are affected by a TPA. The NRC issued a Notice of Violation (NV4 91-08-03) about a year ago for failing to update controlled drawings affected by TPAs. In response to the NOV, the licensee audited all open TPAs to ensure that affected controlled drawings were properly stamped. In addition, the licensee initiated an event investigation to correct the problem and determine its cause. Procedure A-42 was revised and a monthly audit of the TPA log was initiated. Training on the TPA process was also given to technical staff personnel.

Despite these measures, the Team found two TPAs (3-1-28 and 3-56-49) in which affected controlled drawings were not stamped. The second TPA identified as a problem by the Team should have been audited as part of the response to the violation. Past licensee corrective actions for TPA weaknesses were ineffective. In response to the Team finding, the licensee audited both TPA Logs, stamped any affected controlled drawings, and initiated another event investigation.

Another concern raised by the Team dealt with the definition of controlled drawings requiring TPA stamps as defined in Procedure A-42. TPA stamps are placed only on controlled drawings controlled in the main control room, a small subset of all controlled drawings. This list is established as Exhibit 2 in AG-77. The Team noted other controlled drawings (such as connection drawings) that were affected by TPAs that were not stamped. The Team believes that stamping only those drawings listed in AG-77 is questionable. There are many additional controlled drawings in the Document Control Center that are used for troubleshooting, procedure writing and revision, clearance and tagging, modifications, testing, and other maintenance and operations activities. Procedure A-6, "Drawing Control," Revision 19, states that only controlled drawings shall be used for work on safety-related, fire protection, or radwaste systems or equipment. If a controlled drawing available from the Document Control Center is not stamped indicating that it is affected by a TPA, then Procedure A-6 requirements cannot be ensured.

A resident inspector inspection report also identified a similar concern (UNR 91-16-4) with regard to the current classification of various controlled drawings. Category "A" drawings are defined as those used for troubleshooting, permits and blocking, calibration, testing, and maintenance. Category "C" drawings are defined as those that depict the configuration of the plant that is inaccessible. Connection drawings are listed Category "C", but are frequently used for troubleshooting, maintenance, etc. The Team questioned whether all the drawings listed in AG-77 are Category "A", and if the licensee classified their drawings properly.

Finally, the Team identified a TPA in the plant that was not controlled under the TPA program. The I&C group installed jumpers in the Unit 3 main generator stator slot temperature recorders (TRS-5331B and C) using information tags. The procedure used for this activity, AO 50A.1-3, "Jumpering a Generator Stator Slot RTD," Revision 0, requires a TPA for the installation. The licensee immediately initiated a TPA to correct the situation. The Team assessed the significance of this issue and found it to be minor. Only some of the alarms in the control room for increasing main generator slot temperature were bypassed and all automatic main generator trips and runback features were operable. Overall, however, the number of problems identified by the Team with respect to TPAs and their implementation program warrant additional evaluation and attention to previous corrective action effectiveness by the licensee.

The Team also reviewed the temporary procedure change process that ensures that field procedures were the proper revision with all outstanding changes included. Procedure A-3 "Temporary Changes to Procedures" Revision 13, controls the temporary change process. However, this procedure did not ensure that all outstanding temporary changes were controlled to ensure that field procedures were the most recent revision. For instance, surveillance test procedures controlled from the control room are "captured" to alert the user of temporary changes but surveillance test procedures controlled from outside the control room are not "captured." The instrument and controls branch developed procedure MG-5.5-1 "Procedural Changes During Surveillance Testing" to control temporary changes performed by this group that were not controlled by procedure A-3. However, temporary changes to surveillance procedures and routine tests not controlled by either procedure A-3 or MG-5.5-1 did not appear to have adequate provisions to ensure that the most current version of any work procedure is issued to the field. This concern was recognized by the licensee and a revision to procedure A-3 is pending. However, the current system for temporary change control is a Team concern that merits further licensee near term review and corrective actions.

2.4.3.6 NED Program Initiatives

The Team interviewed the NED corporate and station staff engineering personnel, along with Technical Section managers and engineers. Several program initiatives affecting the control of plant design and modification activities were discussed. The Team reviewed selected procedures and evaluated the program initiatives listed below, as was appropriate, to determine the effectiveness and impact upon existing engineering and technical support programmatic controls.

- Design Basis Document (DBD) generation,
- Design Review Board (DRB) assessment of modification packages,
- Plans for "Common Nuclear Procedure" implementation,
- "Engineers of Choice/Contractors of Choice" contracts,
- Modification Process Integration (MPI) program,
- Specification Review for ownership, status and integration into PIMS,
- Configuration Management and Issues Assessments, and
- Self-Assessment results.

The Team determined that the above programs represent strong initiatives for process improvement, but that successful implementation of these programs depends upon continued management attention and support.

2.4.4 Conclusions

The Team concluded that the Technical Section reorganization is an improvement over the former organization and should improve technical support at Peach Bottom. System engineer performance was mixed. Most system engineers are new to their systems due to the reorganization and some system engineers and their Branch Heads were not familiar with certain requirements in their administrative guide. Also, the Team found system performance trending to be weak, but a licensee self-assessment identified the same issue and a program is underway to correct the deficiency. In contrast, response to emerging technical issues was generally good, the system engineer turnover process was working well, and the system engineer training program was good. In addition, the shift system engineer should provide improved communications between Operations and the Technical Section.

The Team found several weaknesses with the TPA process. Past corrective actions for an NRC violation were not effective, the number of TPAs were excessive with one third of them older than a year, drawing classification with respect to TPAs was questioned, and an unauthorized TPA was identified by the Team. This area will require a response by the licensee.

Overall, good engineering and technical service programs are being implemented at Peach Bottom to support safe operation and modification activities at the facility. Long range plans, coordinated and controlled by NED, have been formulated to initiate programmatic improvement in the areas of procedural controls, design basis information flow, and modification work consistency. The existing controls, while adequate, are complicated, somewhat duplicative, and dependent upon interfacing quality programs to define requirements. Also, effective utilization of the full capability of the engineering organization has not been facilitated by the large emergent issue and backlogged workload.

The design input documents provide an adequate basis for all specified modification work, but evidence a lack of total clarity in defining precise acceptance criteria because of generic references to many specifications, their revisions, and corrective action program referrals. Such design document complications are mitigated by the organizational services provided by NED with a site engineering organization assisting in the formal communication chain between NED and the station staff. While the emergent work backlogs require an effort to develop and continually reassess priorities, this workload is currently being adequately managed. Until the emergent work and resulting engineering backlog is reduced, however, the full NED potential for plant betterment initiatives will be impacted.

The licensee generally recognizes that some weaknesses exist in specific areas of engineering control and has implemented interim compensatory measures and initiated long range corporate actions for backlog reduction, response time improvement and the enhancement of design basis and change information controls. While these strong initiatives for the overall improvement of engineering activities have been developed, they are not yet fully implemented. Realization of the NED, site engineering and technical staff potential to perform at their full capabilities requires upper management attention to the allocation of sufficient resources to allow for the continued implementation and progress of the planned enhancements.

2.5 Safety Assessment and Quality Verification

2.5.1. Scope

For the area of safety assessment and quality verification, the Team assessed the following key contributors to assuring safety and quality: (1) the organization and staffing levels of Nuclear Quality Assurance, the Experience Assessment Branch, the Performance Assessment Section, and the Independent Safety Engineering Group; (2) managerial involvement, control, and oversight of plant activities; (3) the quality and scope of self-assessments; and, (4) licensee issue identification, root cause analysis, and corrective actions programs.

2.5.2 Organization and Staffing

The Team reviewed the structure and staffing levels of the Experience Assessment Branch, the Nuclear Quality Assurance group, the Independent Safety Engineering Group, and the Performance Assessment Section. The Team interviewed the head and various members of each group and examined the Peach Bottom Technical Specifications (TS) regarding Administrative Controls. The Team also reviewed the licensee procedures which govern organization and responsibilities for each group.

2.5.2.1 Experience Assessment Branch

The Experience Assessment Branch was staffed to its current level of 7 members in November, 1991. The group consists of an Experience Assessment and Human Performance enhancement System Coordinator and 6 dedicated personnel. The Team assessed branch staffing levels and organization to be adequate. The Team noted, however, that the Experience Assessment Branch coordinator expected approximately a twenty percent increase in event reporting during 1992. This, coupled with the self-identified improvement programs the branch is aspiring to achieve, could potentially overload the branch and reduce its effectiveness.

The Experience Assessment Branch utilizes Group Evaluator/Reportability Coordinators (GE/RCs) and Plant Incident Review Leaders (PIRLs) to review Reportability Evaluation/Event Investigation Forms (RE/EIFs) and perform event investigations, respectively. Both positions require that the individual be trained in root cause analysis and the reportability process. Currently, there are not a sufficient number of GE/RCs and PIRLs overall or in individual departments to handle the work load. With the expected increase in event reporting, these individuals could be overworked, especially in the engineering and maintenance departments. The licensee has identified this and is evaluating the PIRL and GE/RC distribution. Additional training/retraining is planned to ensure an equitable distribution among the various groups.

2.5.2.2 Nuclear Quality Assurance

The Team reviewed the staffing and experience levels in the Quality Assurance, Quality Support, Technical Monitoring, and Quality Verification sections. The Quality Assurance Manager and four Superintendents have in excess of 83 years of nuclear experience and have diverse backgrounds. The Quality Assurance, Quality Support, and Quality Verification sections are fully staffed and have experienced auditors, engineers, and technicians. The Technical Monitoring section is fully staffed with one exception. A monitor position with chemistry/radiological experience has been vacant since December, 1991, and no monitoring has been done in the Services area since late October, 1991. Subsequent to the inspection, the licensee indicated that the position was filled in March.

2.5.2.3 Independent Safety Engineering Group

The Team reviewed the Independent Safety Engineering Group (ISEG) staffing and experience level against the requirements of TS 6.2.3. The TS requires at least five dedicated, full-time engineers, including the ISEG Superintendent. In addition, the ISEG must meet the qualification standards as delineated in TS 6.2.3.2. The group consists of a Superintendent with 17 years of nuclear experience and 4 engineers with a total of 53 years of nuclear experience and meets all the TS requirements. The ISEG is effective in providing independent reviews of plant performance and meets the functional and organizational requirements of the TS.

2.5.2.4 Performance Assessment Section

The Team reviewed the staffing and experience level of the Performance Assessment Section. The group consisted of a Superintendent with over 35 years of nuclear experience and 4 engineers with a total of over 90 years of nuclear experience. The PAS is not a required organization but was created in 1988 to independently evaluate the nuclear activities of the licensee with particular emphasis on identifying areas where performance can be improved. The Team noted that the PAS review has normally been directed to areas where problems have identified a need for in-depth evaluation or to areas not covered by normal QA activities.

2.5.3 Managerial Oversight of Plant Activities

In order to verify a proper safety-conscious atmosphere and management oversight of activities at Peach Bottom, the Team interviewed members of licensee management and reviewed and observed various management meetings. These inspection activities were conducted at both the Peach Bottom station and at corporate locations.

2.5.3.1 Station Oversight

Throughout the course of the inspection, the Team discussed various issues with and interviewed the station Vice President-Peach Bottom and the Plant Manager. Station management has initiated several programs intended to "flatten" the Peach Bottom management and supervision organizational hierarchy, vesting more accountability and responsibility in the lower levels of each department organization. The Team reviewed several plant initiatives designed to contribute to this effort, including: a new Administrative Guideline, AG-100, "Ken Wants Us To Learn," which provides for documenting important information and expectations from plant management; the licensee Supervisory Development Academy, which is attended by first-line supervisors from throughout the plant to teach them the basics of being a manager and team leader; and the "Philosophy, Expectations and Standards" notebook which has been distributed to all plant personnel, outlining the management vision and values for plant operations. The Team determined that the initiatives taken by plant management were positive in their ability to develop and instill a sense of ownership in the Peach Bottom staff, and the programs all stressed safety as a foremost objective.

As positive as this management philosophy appeared to be, the Team determined that a potential weakness had developed at Peach Bottom as a result of its implementation. An objective of "flattening" the organization is to place more responsibility of day-to-day plant operations on the lower levels of supervision, concurrent with encouraging higher level department managers to concentrate on longer range planning and more far reaching goals. The Team noted on several occasions, especially in the operations department and during the transition to this new management style, department activities were below licensee expectations and neither management, supervision, nor working personnel initiated corrective actions. Examples of this were the Operations Department tolerance of degraded control room conditions and poor interface with the Maintenance Department cited earlier in this report. The Team determined that licensee attention is warranted to ensure that potential lapses in management oversight during transition to the new system do not effect safety.

Another area inspected by the Team was the performance of the Plant Operations Review Committee (PORC). The PORC is a TS required body whose function is to advise the Plant Manager on all matters related to nuclear safety. The Team attended two routine PORC meetings while on site, reviewed the minutes of past meetings, and reviewed the two procedures which control PORC: A-4, "Plant Operations Review Committee," and AG-12, "PORC Administration."

The Team determined that the PORC process at Peach Bottom complies with all TS requirements, but noted two conditions that the licensee is addressing which prevents PORC from being fully utilized. The PORC appeared to be overburdened with an administrative workload consisting of minor plant alterations and procedure revisions and changes. A majority of these changes were not safety significant and were adequately reviewed within the plant staff. PORC reviewed them only to comply with TS requirements, which occupied PORC time and not did not allow the Committee to focus on larger plant issues of nuclear safety. The Team noted that over the last six months of PORC meetings reviewed by the Team, the PORC composition, including the PORC Chairman, varied from meeting to meeting quite significantly. As an example, the PORC Chairman, as designated by the TS, is the Operations Superintendent; however during that time frame the Operations Superintendent chaired only approximately 30% of the PORC meetings. The Peach Bottom TS provide for alternate PORC members and Chairmen, yet the Team was concerned that such varied PORC composition prevented PORC from advising the Plant Manager with a consistent nuclear safety perspective.

The Team learned that the license has taken or is planning to take in the near future steps to remedy both Team concerns. To ease the PORC administrative workload, the licensee has submitted a TS change fora Station Qualified Reviewer program, which would allow qualified engineers to provide, with peer reviews, determinations of safety significance and to effectively minimize the need for full PORC review of many of the administrative changes that now overload the PORC schedule. The Team concluded that this initiative should allow the PORC to better meet its intended TS function. In the interim, station management has initiated a program of monthly PORC meetings titled "PORC Oversight Meetings," which are convened in addition to routine biweekly PORC meetings. These additional meetings are devoted entirely to the review of potentially safety significant plant issues, and administrative items are intentionally omitted from the agenda. Once the SQR process is in place, the licensee intends to revise the PORC TS and PORC process to focus the Committee functions and its ability to advise the Plant Manager on nuclear safety issues. The Team concluded that the interim and planned measures improve the PORC process and increase the PORC ability to ensure the safe operation of Peach Bottom.

2.5.3.2 Corporate Oversight

In order to assess the licensee corporate safety perspective and its effect on the operation of Peach Bottom, the Team interviewed several senior NQA managers at the Chesterbrook Corporate offices and attended two corporate level meetings held at Peach Bottom.

At Chesterbrook, the Team interviewed the Performance Assessment Section Superintendent, the Corporate Nuclear Quality Division Manager, and the Nuclear Quality Assurance General Manager. The issues discussed with these managers included the corporate perspective of operations at Peach Bottom, the function of NQA at the station, and current initiatives underway to address potential or previously identified safety concerns at Peach Bottom. The Team noted the PAS as a strength in the organization and recognized the section experience, its handling of an internal Safety System Functional Inspection effort, and its assessment reports as noteworthy assets. The Team also determined that NQA maintains close contact with the operation of Peach Bottom and is reactive to safety concerns as they arise at the plant. A good initiative is the NQA task Team addressing the previously identified problems in the Peach Bottom corrective actions programs.

The two corporate level meetings observed by the Team were the meeting of the licensee Nuclear Review Board (NRB) and the Senior Vice President-Nuclear update meeting. The NRB meets monthly, alternately at Peach Bottom and Limerick, to accomplish their function of reviewing pertinent information in order to make recommendations to the Senior Vice President-Nuclear as to the safe operation of the nuclear stations. The NRB is composed of senior licensee executives and outside consultants and was observed by the Team to review and discuss plant operations, events, and trends and assess their impact on the safety of the plant. The Senior Vice President-Nuclear convenes plant update meetings monthly at Peach Bottom in which plant management, including the Plant Manager and his Department Superintendents, reports on plant status and events. The two meeting formats provided corporate management with insights into the operation of the plant and allowed for management to pass their expectations and concerns to the Peach Bottom staff. The Team noted the meetings as good initiatives in which senior management held the Peach Bottom staff accountable for their responsibility to operate the plant in a safe manner.

2.5.4 Self-Assessments

In order to assess the licensee ability to assure the safe operation of Peach Bottom, the Team reviewed the Peach Bottom self-assessment process and the Nuclear Quality Assurance audit and assessment programs.

2.5.4.1 Peach Bottom Self-Assessment

The Peach Bottom self-assessment process is guided by an Administrative Guideline, AG-59, "Self-Assessment," which was first issued in September 1991. The guideline lists baseline values for self-assessment and establishes a model for the process, which can be applied to assessments of varying scope. Of particular interest to the Team was the station-wide self-assessment which had been concluded just prior to the conduct of this inspection. This assessment was conducted across the station organization on a departmental basis, and each department assessed its own personnel, processes/procedures, and physical plant attributes with a scheme of strengths, watch areas, and weaknesses. The Team reviewed the individual assessments prepared by each station department and noted the process to be a good initiative with the potential to provide for each department improving performance. The Team also observed, however, that the assessments were inconsistent in scope and content, and there were no present plans for any corrective actions included in the assessments. These shortcomings may be attributed to the newness of the program, were acknowledged by the licensee, and should be resolved as the self-assessment process matures.

2.5.4.2 NQA Audits and Assessments

The Team reviewed the content and findings of several audit reports which had been completed by Peach Bottom NQA and ISEG over the past year. The selected audits covered all functional areas of Peach Bottom operation and were reviewed to assess safety perspective and contribution to the safety of the plant. NQA had previously identified, and the Team also determined, that some of the NQA audits had not addressed all elements defined by the audit plan and, therefore, the NQA audit program had not met the requirements defined in procedure NQA-21,"NQA Audits." The Team noted that the audit deficiencies prevented the fulfillment of the QA function, and the licensee had begun to implement corrective actions, the completion of which were scheduled for after the close of the inspection. The Team also reviewed surveillance reports documenting inspections conducted by NQA Technical Monitoring and concluded that the role of this group to independently assess various plant activities as needed, above and beyond the normal QA function, was good, and it has been effective. The ISEG also conducts surveillances, and the reports documenting them were reviewed by the Team and found to be insightful, especially from the technical aspect. In 1991, ISEG initiated a new role, which was to provide to the Plant Manager a summary assessment report on the performance of the station over the previous year. The Team reviewed the "1990 Annual Summary Assessment Report" and the draft "1991 Annual Summary Assessment Report." Both reports were good with comprehensive summaries which provided the Plant Manager with a useful tool to assess the strengths and weaknesses of station operations.

2.5.5 Issue Identification, Root Cause Analysis and Corrective Action

The most recent SALP report noted good performance in the identification of problems, however, licensee corrective action processes did not consistently ensure that the root causes for performance deficiencies were identified, and effective and lasting corrective actions were developed and implemented. In response to this concern, the licensee: 1) rewrote several procedures, 2) formed a Corrective Action Program Task Force which was charged with making recommendations regarding the corrective action processes, 3) strengthened the Experience Assessment Branch, and 4) applied stronger managerial oversight to the overall process.

The Team assessment of the overall corrective action process focused on four areas: 1) issue identification, 2) root cause analysis, 3) quality of analysis, and 4) corrective action tracking and trending.

2.5.5.1 Issue Identification

The Team assessed the methods and thresholds for reporting conditions adverse to quality (CAQs) within the facility. When a potential CAQ is identified, the vehicle through which it is reported varies due to the specifics of the corrective action system (CAS). The following are several of the vehicles used to report these CAQs--

- The RE/EIF is used to report an in-house event which could potentially require an investigation. The definition of an event, as stated in the "Investigation of In-house Events" procedure, NA-02A002, Rev 2, is unclear as to the threshold for which an event should be reported. In addition, the shift notification/operability determination is a judgement call by the initiator and GE/RC, and does not get a second review until the event investigation coordinator (EIC) approves it.

- The Corrective Action Request (CAR) is used to identify a CAQ when there is a breakdown in managerial or procedural controls in areas of: QA criteria, licensing, regulatory requirements, or repetitive deviations of the same nature that can affect quality. A CAR normally is issued as a result of an audit or a CAQ which management identified. An individual can also initiate a CAR, which is referred to as a self-initiated CAR, to report a CAQ. The CAR is then classified into one of three different levels (i.e., management level, medium level, or deviation) depending on the significance of the CAQ.

- The Radiological Occurrence Report (ROR) is used to report a radiological event or CAQ.

- Equipment Trouble Tags (ETTs) are used to identify and report plant-material condition deficiencies. An Action Request (A/R) is then written to request that the condition be repaired.

- A Non-Conformance Report (NRC) is used to document a condition, or procedure which renders the quality of hardware (material, system, structure, or component) unacceptable or indeterminate.

The Team determined that no inadequacies exist in the overall method of identifying and reporting CAQs. Notwithstanding, some issues, such as procedure deficiencies and component failures, are eligible for more than one corrective action program which in and of itself has the potential to cause confusion and inconsistent process application. Further, each method is independent and has its own database, therefore, overall coordination among the corrective action programs is diffic lt and not ensured. In addition, the threshold for reporting a CAQ is not clearly defined among the corrective action programs, thereby making trending for the lower threshold events difficult.

2.5.5.2 Root Cause Analysis

The Team assessed licensee methods for conducting root cause analysis for a CAQ. Currently the only systems that require root cause analysis (unless it is determined to be not necessary) are the RE/EIF and CAR systems. The ROR requires a RE/EIF to be completed only if it is a level 1 or 2 event. The ETT-A/R trending method has recently been updated (effective date March 10, 1992) to require a RE/EIF to be written if a component has had three or more A/Rs generated on it within the past 18 months. In addition, if a component has had three rejected A/Rs written on it within the last 12 months (with similar problem description), it will have RE/EIF written on it. The procedure for controlling NCRs has recently been updated (effective date February 3, 1992), and one of the changes involves root cause analysis. As during the disposition phase of a NCR, a determination as to whether root cause analysis should be pursued is made. If root cause analysis is needed, a CAR or RE/EIF is generated.

Trending of data is currently cumbersome since problems may be identified in duplicate data bases or not in any data base. Events which require a ROR to be generated do not get trended unless they reach level 1 or 2 status. Component events which cause either a RE/EIF or a CAR to be generated may not get trended properly if information is contained in both or either data base. The licensee is working toward a common trending program, but that process is more than a year away. Currently, licensee trending of events is weak; however, management is cognizant of this and appears to be enacting appropriate measures to enhance trending program effectiveness.

The Team assessed the root cause analysis training and the number of people qualified in each department. Initial training was given in 1990, but there currently is not a procedure which indicates the periodicity the training should be given. In addition, there is not a procedure which indicates the number of personnel required to be trained in root cause analysis within each department. Since the RE/EIF program is increasing the number of issues identified and subsequent investigations required, without a sufficient number of qualified investigators within each Department (especially operations, technical, and maintenance), the system has the potential to become overloaded. The Experience Assessment Branch has identified the training issue and is moving toward a solution.

2.5.5.3 Quality of Analysis

The Team assessed several RE/EIFs completed during the past six months for completeness, proper root cause analysis, and corrective actions. The Team concluded that the responses met the requirements of NA-02A002, however, the Team noted the following: 1) several of the RE/EIFs were not filled out entirely so a clear audit trail could not be followed; 2) the root cause analysis did not address generic corrective actions, both with personnel training and similar equipment; and 3) there was no mention of interim corrective actions in a few RE/EIFs that required it. Procedure NA-02A002 does not address interim corrective action which could be completed while the investigation is in process. In addition, the EIC does not follow the corrective actions to completion. This could potentially cause a corrective action, which was a priority in the investigation, to not receive proper attention. The licensee, in its self-assessment, has addressed these problems and is working toward correction.

The Team assessed several CARs initiated in 1991 for completeness, proper root cause analysis, and corrective actions. The Team concluded that the responses met the requirements of NQA-25, "Corrective Action," however, the determination of whether a root cause analysis should be performed was inconsistent. In addition, a few CARs targeted the corrective actions at the personnel involved and not at the more generic implications. The licensee has recently (effective date February 15, 1992) updated NQA-25 and the procedure now stresses root cause analysis and corrective actions. The new procedure and its effect on the CAR process could not be assessed for this report due to its recent issue date.

2.5.5.4 Corrective Action Tracking

The Team assessed licensee methods for tracking corrective actions. A CAR gets tracked through PIMS and when all the actions are completed, QA takes the CAR to the completed status. RE/EIFs get tracked through PIMS also, but the EIC is not delegated responsibility to approve action item is completed. Rather, the department with the action has the responsibility to assign completed status. NCRs are also tracked through PIMS and when completed, must go through QA for final closure. RORs use the RE/EIF method for tracking corrective actions for level 1 or 2 events. The ETT and A/R are tracked through PIMS and the action group is responsible for closure.

Currently there is no overall coordinator with the responsibility of tracking corrective actions. Certain methods are tracked from initiation until completion, while others are "handed-off" to the responsible department. This creates the potential of a corrective action not receiving the priority it had during its approval.

2.5.5.5 Overall Corrective Action Process

The licensee overall corrective action program is somewhat disjointed and although some of the corrective action programs fulfill the requirements of a good correction action process, others warrant a review for improvement. The threshold for event identification is not clearly defined and due to the numerous corrective action processes, personnel may not be completely familiar with them all. Root cause analysis is not done consistently on all events (requiring analysis) and due to duplicate data bases, may not be effective with respect to trending. Investigations are generally thorough, but at times do not address the generic implications of the event. The use of PIMS in tracking corrective actions is a positive initiative, however effective oversight is necessary to ensure comprehensive follow up of priority issues.

The licensee has identified the weaknesses in this area and has initiated several programs for self-improvement. A Corrective Action Program Task Force was formed to make recommendations for improvements. Senior management in both QA and at the facility are placing more emphasis on proper corrective actions. The Experience Assessment Branch will be rewriting the procedure for In-House Investigations which will incorporate many of the problems mentioned above. QA and the Experience Assessment Branch are both working towards a commonality in root cause identifiers and merging their two databases. Since these initiatives have either been recently put into effect or are scheduled for implementation later this year, the Team cannot assess the quality of the licensee improvements. However, the licensee appears to be effectively addressing the issues of concern.

2.5.6 Conclusion

The licensee organization has provided a good company and station management structure to assess and provide for the safe operation of Peach Bottom. Corporate and station management have a good safety perspective and have been aggressive in the development of a safety conscious management system for the plant. The team noted, however, potential weaknesses occurring during the transition to the new system. The Peach Bottom quality assurance organizations (NQA and ISEG) meet all Technical Specification requirements and are adequately staffed with qualified personnel. The station has taken steps to correct previously identified problem areas, such as PORC work load and corrective action ineffectiveness. The Event Assessment Branch is among several licensee initiatives to address the problems which have occurred with event tracking, root cause analysis, and the corrective action process. When the planned and initiated programs and systems are fully implemented, the safety assessment and quality verification process at Peach Bottom should be much improved and more effective.

ATTACHMENT 1

UNRESOLVED ITEMS FROM THE PEACH BOTTOM IPAT INSPECTION

Unresolved Item 92-80-01, "Assessment of Inoperable Control Room Instrumentation."

- The Team identified three instances in which the effect of inoperable control room instrumentation had not been effectively evaluated with respect to emergency operating procedure implementation. The Team expressed concern for the total number of inoperable control room instrumentation, the cumulative effect of the inoperable equipment on operator and plant response to transients, and the effectiveness of operational evaluations for inoperable instrumentation. (Section 2.1.4)

Unresolved Item 92-80-02, "Immediate Interim Corrective Actions to Self-Assessment Weaknesses."

- The recent station-wide self-assessment identified many opportunities for improved performance. The majority of areas are such that extended improvement programs are appropriate. However, the Team concluded several self-assessment weakness observations may require more immediate corrective measures to reduce the potential for future safety problems. Specifically, the Team observed weaknesses in the administrative controls for maintenance troubleshooting development and work package quality. However, the licensee should assess all self-assessment observations for applicability. (Section 2.3.1 and subsections)

Unresolved Item 92-80-03, "Assessment of Operational Impact of Installed Instrumentation Found to be Out of Calibration."

- The Team noted that the licensee lacked procedures to ensure that permanently installed instrumentation found to be out of calibration is properly assessed for effect on related system operability. (Section 2.3.1)

Unresolved Item 92-80-04, "Adequacy of Modification, Temporary Plant Alteration, and Temporary Procedure Change Document Controls."

- The Team noted isolated instances in which procedures and drawings affected by plant modifications had not been properly revised. The Team observed several instances in which controlled drawings affected by TPAs were not properly annotated. Additionally, the Team observed apparent discrepancy with controlled drawing classification such that improper usage may occur. (Sections 2.4.3.2 and 2.4.3.5)