ENCLOSURE

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)

PEACH BOTTOM ATOMIC POWER STATION UNITS 2 AND 3

REPORT NOS. 50-277/97-99 AND 50-278/97-99

I. BACKGROUND

The SALP Board convened on June 19, 1997, to assess PECO Energy's (PECO) nuclear safety performance at the Peach Bottom Atomic Power Station during the period October 15, 1995, to June 7, 1997. The Board was conducted pursuant to NRC Management Directive (MD) 8.6, "Systematic Assessment of Licensee Performance." Board members were James T. Wiggins, (Board Chairman), Director, Division of Reactor Safety, NRC Region I (RI), Larry E. Nicholson, Deputy Director, Division of Reactor Projects, RI, and John F. Stolz, Director, Project Directorate I-2, NRC Office of Nuclear Reactor Regulation. The Board developed this assessment for the approval of the NRC Region I Administrator.

The performance ratings and the functional areas used below are described in NRC MD 8.6 (See NRC Administrative Letter 93-20).

II. PERFORMANCE ANALYSIS - OPERATIONS

Performance in the area of Operations continued to be excellent. Strong management involvement in day-to-day operation contributed to the excellent operation of both units during the period. Plant management demonstrated excellent monitoring and understanding of plant evolutions and material conditions. PECO effectively implemented the improved technical specifications (ITS), including good controls over new surveillance tests and other items formerly located in the plant technical specifications.

Routine evolutions were well-planned and implemented by the Operations department. Shift turnovers were thorough and communications were very good. Clear documentation of events and issues was noted in control room logs, action requests, and problem identification system documents. Operators maintained good plant equipment status and properly controlled minor equipment problems. The action request system was effectively used to document timely operability determinations for degraded equipment, and to identify problems needing engineering support. Operators maintained an acute awareness of degraded and out-of-service conditions, and provided proper priority and facilitation to workaround issues.

Operator human performance during the conduct of operations was excellent. The licensed operator qualification training program remained good; with improved performance during license examinations. No operator errors contributed to reactor scrams or transients, and operators response to transients was very good, particularly during recovery from three reactor scrams and from several partial losses of offsite power. Some problems were noted that indicated the need for improvement in operator attention-to-detail. The problems included failure to recognize the impact of starting a reactor feed pump at low flow during startup, inability to promptly determine spent fuel pool temperature, and the insertion of the wrong control rod one notch. Also, there were some auxiliary operator procedure adherence problems. The safety consequences of each problem was low, and in each case PECO management recognized the personnel performance issues and took prompt corrective actions to preclude repetition.

The problem identification and corrective action systems continued to be effectively used to address operations-related issues. Management strongly supported efforts to further improve corrective action process effectiveness by carefully addressing several self-identified areas for improvement within the program. PECO maintained a broad self-assessment program. The independent safety engineering group (ISEG), nuclear review board (NRB) and plant operation review committee (PORC) continued to provide strong oversight of plant operational activities. These efforts properly maintained a focus on safety as shown by the proper implementation of ITS.

In summary, performance in the area of Operations continued to be excellent. Routine evolutions were generally planned and executed with care and precision. The operators responded to events and transients in an outstanding manner. Management provided rigorous and sound safety oversight of most plant activities. Actions to reduce operator attention-to-detail errors were effective. Oversight of station safety effectiveness encompassed by ISEG, PORC, and NRB continued to provide excellent assessment and focus on sustained plant safety and equipment reliability.

The Operations area is rated **Category 1**.

III. MAINTENANCE

PECO continued to maintain overall excellent plant equipment/material condition. Effective preventive and timely corrective maintenance activities have maintained the high degree of equipment availability and reliability. While several plant transients were caused by balance of plant equipment failures such as with the negative phase sequence current relay, none of these failures was judged to be maintenance-preventable. Further, the staff responded well to promptly identify, prioritize and correct degraded equipment conditions. Exceptions were two instances where the initial attempts to correct high pressure coolant injection (HPCI) steam admission valve opening timing and emergency diesel generator (EDG) oscillation were unsuccessful and led to increased system unavailability. The material condition focus list effectively highlighted areas that needed further attention.

In general, PECO conducted well planned on-line and outage corrective maintenance activities. The work control process was effectively used to plan and coordinate on-line maintenance activities. This effort included risk assessment of equipment outages and maintenance schedules to maximize plant safety margins. However, in one instance, the effect of maintenance on the seismic qualification of relays had not been properly considered during work planning. The overall rework rate was low, and PECO launched an initiative to enhance tracking of this maintenance indicator. Over this period, post-maintenance testing improved in its ability to identify and correct maintenance-related problems.

Maintenance personnel generally performed well, demonstrating good knowledge and good use of procedures. For example, mechanical, electrical, and instrumentation technicians conducted well coordinated and effective periodic overhauls of emergency diesel generators. Deficiencies noted during maintenance activities were identified and documented, and PECO management took appropriate corrective actions. For example, several issues of minor consequence were addressed well, including: removal of a wrong fuse during on-line maintenance causing a fully withdrawn control rod to scram; mis-calibration of the Unit 2 feedwater temperature instruments, which effected thermal power; and failure to properly document prior approval of overtime. Some issues related to control and qualification of contractors were noted. Specifically, those issues involved failure to implement established installation procedures for scaffolding, and an improperly soldered connection that caused the Unit 3 HPCI system to be inoperable. PECO responded effectively to those problems by enhancing the oversight of contractor work at the site.

As discussed in the Engineering assessment, PECO's initial implementation of the maintenance rule was problematic. However, the weaknesses found were offset by the high state of safety-related equipment reliability, and the adequacy of plant equipment performance monitoring using non-maintenance rule processes. Further, good maintenance rule implementation following programmatic corrective actions provided a process that properly monitored systems and identified, tracked, and evaluated functional failures.

Surveillance testing showed sound performance, with an aggressive questioning attitude applied to identify and correct equipment problems. Operators and technicians used good communications and remained aware of plant conditions before, during, and after testing. Shift management was aware of changing plant conditions and of alarm status. Instrument technicians routinely demonstrated a good questioning attitude as shown by their seeking supervisory guidance after they found bus undervoltage relays out-of-calibration. PECO properly implemented a new testing method to ensure acceptable control rod performance following replacement of the scram solenoid pilot valve diaphragms. Further, inservice testing and inservice inspection programs were properly controlled and conducted.

PECO continued to conduct maintenance and surveillance activities in an excellent manner, supporting safe operation of both units. Safety-related equipment was maintained in a high state of readiness. As equipment or human performance issues arose, PECO took aggressive corrective actions to identify and correct the causes. The control and supervision of contractors was not always effective.

The Maintenance area was rated **Category 1**.

IV. ENGINEERING

Overall, engineering activities supported plant operations effectively. Station management consistently provided an excellent level of oversight and attention to engineering activities at the site, particularly through the work week management process. Engineering issues were communicated well during daily meetings and the engineering backlog was well managed. Typically, the site organization responded expeditiously to equipment problems that required engineered solutions. For example, troubleshooting activities included the appropriate engineering considerations. Also, the engineering organization responded skillfully to a leak in the high pressure service water system and to fluctuations observed in emergency diesel generator loading during routine testing. Self-assessment activities, as complemented by reviews conducted by the Independent Safety Engineering Group, were effective in monitoring and improving performance in the engineering area.

Engineering design and analysis activities associated with modifications during this period, including temporary plant alterations, were of excellent technical quality. For example, a current program to evaluate modifications required to ameliorate high pressure coolant injection system piping vibration included a thorough analysis of the system conditions. Also, a reanalysis of the effects of a past plant modification on residual heat removal (RHR) system sequencing was comprehensive in resolving some old design issues. However, problems occurred associated with some modification activities. For example, some of the variables that affected the core thermal power calculation by the process computer were not well-understood or controlled by reactor engineering. In these cases, thorough safety evaluations and operability determinations supported the safe operation of the plant.

During the period, some problems were noted associated with the maintenance of the licensing and design bases and with the translation of design information into procedures. For example, the 10CFR 50.59 safety evaluation that supported a modification that required holes to be cut into the turbine building walls lacked an adequate consideration of the release path that resulted from those holes. In addition, a procedure that allowed the use of the standby gas treatment system in a mode outside its design introduced a new single failure vulnerability that was not detected during the development, approval or use of that procedure. Further, problems with the scope of periodic tests and test acceptance criteria were found. For example, emergency diesel generator ventilation system capacity was not verified through testing. Also, routine channel checks did not assess the availability of the reactor feed pump automatic trip on high reactor vessel water level, and the boroflex content of the spent fuel racks was not being tested per commitments in the Updated Final Safety Evaluation Report (UFSAR). Further, the acceptance criteria for electrical distribution system undervoltage relay settings were not consistent with the plant licensing bases. The above problems served to underscore the need for the project the licensee committed to in response to the NRC 10CFR 50.54(f) letter.

Also during the period, NRC noted that some important aspects of the licensee's maintenance rule program were not established correctly. Those aspects dealt, principally, with the performance criteria selected for use in assessing the effectiveness of the preventive maintenance program applied to systems covered by the rule. Neither management oversight, nor independent assessment by Quality Assurance, ISEG, or the safety review committees were effective in averting the weaknesses noted. Nevertheless, NRC found that the material condition of the plant, particularly its safety-related equipment, remained excellent. However, NRC also noted a few balance of plant (BOP) equipment problems that caused plant transients and challenged operators. Continued engineering focus on preemptive identification and correction of these transient initiators was warranted.

System managers continued to demonstrate an excellent level of knowledge associated with their systems and their activities contributed to maintaining equipment reliability. System managers and their supervisors responded well to several complex issues, such as those associated with RHR sequencing, high pressure coolant injection turbine valve operation, and emergency diesel generator load fluctuations. Design engineering personnel also displayed very good technical knowledge. However, some minor personnel errors occurred that were dealt with well by the site organization.

In summary, station management provided excellent oversight and control of engineering activities throughout the period. Engineering analyses and evaluations were of excellent technical quality and were typically comprehensive. Personnel engaged in engineering activities were knowledgeable. Nevertheless, some minor errors occurred associated with modification activities. Some problems with the maintenance of the design and licensing bases and the translation of those bases into procedures were found that emphasized the need for the licensee to complete its commitments made in response to the NRC 10CFR 50.54(f) letter. Also, some problems were found related to the establishment of the maintenance rule program; however, those problems did not adversely affect the material condition of plant safety systems. Additional focus on the performance of BOP equipment was appropriate to minimize plant transients that challenge the operators.

The Engineering area was rated **Category 2**.

V. PERFORMANCE ANALYSIS -- PLANT SUPPORT

The occupational radiation protection program continued to be effectively implemented throughout the period. An effective internal and external radiological controls program was implemented with no unplanned exposures of note. With the exception of isolated examples, PECO implemented very good radworker practices. Workers followed radiation work permits and exhibited proper use of dosimetry and effective contamination control practices. PECO identified a problem involving control of keys to high radiation areas and took effective corrective actions.

An effective ALARA program was conducted including identification and implementation of lessons learned, implementation of bench marking initiatives, use of robotics, training of radiation workers, and effective planning and preparation for outage work activities including planned and emergent work. Appropriate exposure goals for work activities were established and closely tracked. PECO continued aggressive shielding and decontamination efforts. In addition to routine hot spot reduction, flushing practices, and modifications to reduce unnecessary personnel exposure, PECO established a source term reduction team to review station radiological conditions and recommend initiatives to reduce ambient radiation dose rates. PECO also completed the Unit 2 outage during this period in 19 days, which served, in part, to significantly reduce the aggregate exposure for the station for the last two years.

PECO implemented an overall effective radioactive waste (radwaste) processing, reduction, handling, storage, and transportation program including effective implementation of the revised Department of Transportation (DOT) and NRC radioactive material shipping regulations. Some minor discrepancies with UFSAR conformance in the area of radwaste processing were noted, and the training program required by the new DOT training rule (49 CFR 172 Subpart H) was not well defined. PECO took action on the UFSAR matters and enhanced the training program description.

Generally, PECO implemented good chemistry practices. For example, the chemistry department responded properly to unexpected reactor coolant conductivity increases. PECO took effective action to correct sampling process and analysis problems identified with the standby liquid control system samples.

The effluent controls, environmental monitoring, and meteorological monitoring programs were effective. Audits were effective in assessing program strengths and weaknesses and the performance of the contract environmental laboratory was considered a strength. Material condition of equipment related to environmental and meteorological monitoring was good. However, some performance problems were noted associated with the burning of slightly contaminated oil without consideration of non-gamma emitters in release calculations and the release of sewage without an evaluation. Further, lack of configuration control for decontamination equipment resulted in detectable activity in the monitored hot shop ventilation system exhaust.

An overall effective security program was implemented. There was very good management support and effective controls for identifying, resolving, and preventing security problems. PECO identified that a number of individuals improperly obtained grand master keys that could open security doors at both Peach Bottom and Limerick and also identified problems with control of safeguards information (SGI). PECO performed a timely and comprehensive investigation of these matters and took appropriate corrective actions.

The emergency preparedness (EP) program was effectively implemented and management support for the program was evident. With the exception of minor discrepancies found in the technical support center, generally, the emergency facilities and associated equipment were well-maintained and operationally ready. Areas for program improvement included

the quality assurance program for the emergency plan and implementing procedures. Performance during the November 1996, full participation emergency preparedness exercise was very good.

Overall, fire protection procedures provided good guidance and controls to prevent fires, maintain fire fighting capabilities and respond to any fires which may occur. The program was effectively implemented.

The overall material condition and housekeeping at the station was very good. PECO cleaned and repainted rooms that exhibited degraded conditions and repaired the majority of groundwater inleakage problems.

Overall, PECO implemented effective problem identification, root cause assessment, and corrective action programs in the Plant Support area. Of particular note was a comprehensive evaluation of the radiological controls program. Also, the radwaste program and system validation relative to the UFSAR descriptions was appropriate.

In summary, PECO implemented an overall very good occupational radiological controls program including exposure control programs and contamination control programs. The radioactive waste processing, handling, storage and transportation program was very good. Very good radioactive effluent control and radiological environmental monitoring programs were implemented, but several instances of weaknesses associated with evaluation and control of potential release paths were noted. An effective security program was implemented at the site but problems were identified in the area of SGI control and key control. An effective EP program was implemented. The fire protection and prevention program was effective. The self-identification, root cause analysis, and corrective action programs were overall effective. Material condition of the station including housekeeping was overall very good.

The plant support area is rated **Category 1**.

PLANNED NRC INSPECTIONS

June 7, 1997 - June 6, 1998

PEACH BOTTOM ATOMIC POWER STATION

UNITS 2 AND 3

IP - NRC Inspection Procedure
Core Procedure - NRC Inspection Program Mandatory Inspection
TBD - To Be Determined

Procedure Number	TITLE	Target Date	
IP73753	Inservice Inspection	- Core Procedure	09/29/97
IP 83750	Occupational Radiation Exposure (RADCON-Outage)	- Core Procedure	10/20/97
IP 83750	Occupational Radiation Exposure (RADCON-Visit 1)	- Core Procedure	04/20/98
IP 84750	Radwaste Treatment & Effluents & Environ. Monitoring (Visit 1)	- Core Procedure	10/27/97
IP 84750	Radwaste Treatment & Effluents & Environ. Monitoring (Visit 2)	- Core Procedure	06/01/98
IP 86750	Radioactive Waste Transportation	- Core Procedure	08/18/97
IP 81700	Physical Security Program (Visit 1)	- Core Procedure	09/02/97
IP 37750	Engineering Focus Inspection (Including Followup to 10 CFR 50.54(f) response commitments)	- Core Procedure	TBD