UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 170 AND 174 TO FACILITY OPERATING

LICENSE NOS. DPR-44 and DPR-56

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNIT NOS. 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By letter dated January 10, 1992, Philadelphia Electric Company (PECo), Public Service Electric and Gas Company, Delmarva Power and Light Company, and Atlantic City Electric Company (the licensees) requested an amendment to the Peach Bottom Atomic Power Station (PBAPS) Unit Nos. 2 and 3, Technical Specifications (TSs) regarding a revision to the allowable out of service time (AOT) for the emergency service water (ESW) system pumps. In addition, the licensee proposed revisions to the operability and surveillance requirements of components included in the emergency heat sink (EHS) system, additional surveillance requirements for the ESW system, and changes to the TS Bases reflecting the above additions and revisions. In response to a staff request, the licensee provided additional information with regard to the proposed TS amendment by letter dated April 3, 1992. Further clarification of the Probabilistic Risk Assessment (PRA) analysis performed by the licensee was obtained through a telephone conversation with PECo representatives on April 10, 1992. By letter dated July 20, 1992, the licensee revised the January 10, 1992 submittal. The revision corrected discrepancies between the description of the proposed changes and the marked up TS pages. The July 20, 1992 submittal did not change the substance of the January 10, 1992 submittal. The April 3, 1992 and July 20, 1992 letters provided clarifying information that was not outside the scope of the original Federal Register Notice and did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The ESW system consists of two parallel full capacity ESW pumps, and associated piping, heat exchangers, valves and controls. The EHS system consists of one full capacity emergency cooling water (ECW) pump, two parallel full capacity ESW booster pumps, an induced draft emergency cooling tower (ECT) with an integral water storage reservoir, and associated piping, valves

and controls. ESW and EHS system components are supplied with AC power from the emergency buses to allow operation during a loss of off-site power (LOOP).

The ESW system provides the only supply of cooling water to the emergency diesel generators (EDGs). Under normal operating conditions, the non-safety-related normal service water (NSW) system supplies cooling water to emergency core cooling system (ECCS) components, ECCS pump room coolers, and reactor core isolation cooling (RCIC) pump room coolers. When the NSW supply is unavailable, such as following a LOOP, and an ESW pump is operating, a check valve arrangement allows the ESW system to automatically begin supplying these heat exchangers with cooling water.

The licensee has not conclusively demonstrated that the ECW pump and the associated EHS system is equivalent to an ESW pump in performing the ESW pump safety function. However, the piping arrangement and system performance characteristics are such that the ECW pump is capable of supplying sufficient cooling water flow to the ESW system to meet design basis flow requirements to the EDGs, ECCS components, ECCS pump room coolers, and RCIC pump room coolers.

The licensee recognized the following deficiencies with regard to the current PBAPS TSs: continued operation with one ESW pump inoperable is not addressed; continued operation with two ESW pumps inoperable is allowed for a period not to exceed one month; and the ECW pump and the associated EHS system is permitted to be considered equivalent to an ESW pump. The licensee partially addressed these deficiencies through Plant On-site Review Committee (PORC) Position No. 33 by imposing administrative limits on plant operation with one or two ESW pumps inoperable, and by administratively prohibiting consideration of the operability of the ECW pump and the associated EHS system as equivalent to the operability of one ESW pump.

In order to fully address the above noted TS deficiencies, the licensee proposed revisions to the PBAPS TSs which include: an additional limiting condition for operation (LCO) requiring a reactor shutdown to the cold shutdown condition within 24 hours should one ESW pump remain inoperable for a period in excess of 7 days; a revised LCO requiring the reactor be placed in hot shutdown within 6 hours and cold shutdown within 36 hours should both ESW pumps become inoperable; and deletion of the section permitting establishment of ECW and ESW pump equivalency. The licensee's proposed changes to the PBAPS TSs also include the following: addition of a requirement to test the ECW and ESW booster pumps in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where relief has been granted, effectively reducing the surveillance test interval (STI) for these pumps from once every operating cycle to once every three months; a reduction of the STI for the ECT fans from once per operating cycle to once every three months; addition of a surveillance test requirement for valve position verification consistent with the standard TSs; and addition of a surveillance test requirement to inspect and clean the ESW pump intake structure once every operating cycle. In addition, the licensee proposed revisions to the TS Bases reflecting the above changes and other changes of a purely administrative nature.

3.0 EVALUATION

Due to the differences in configuration between the PBAPS ESW system and the generic plant service water system described in the standard TSs, the staff could not directly apply the guidance of the standard TSs with regard to establishing AOTs for ESW system components at PBAPS. The staff based the review of the proposed 7-day AOT for a single inoperable ESW pump on the relative importance of ESW to other equipment required to cope with design basis events.

The licensee performed an analysis to compare the relative impact on core damage frequency of an assumed unavailability of 7 days per year for the high pressure coolant injection (HPCI) system and each EDG to that for a 7-day-per-year unavailability for each ESW pump. Operation of the ECW pump was not credited in the analysis. The licensee determined that the impact of the assumed unavailability of a single ESW pump on core damage frequency was less than that of any one EDG or the HPCI system. Since the AOT for a single inoperable EDG and the AOT for an inoperable HPCI system both equal 7 days, the licensee concluded that a 7 day AOT was appropriate for a single inoperable ESW pump.

The staff determined the accident sequences of primary concern with regard to ESW pump unavailability to be those sequences involving a total LOOP. These sequences are critical due to the importance of an ESW system cooling water supply to the EDGs following a LOOP. Without adequate cooling to the EDGs in this situation, a station blackout scenario results. Under station blackout conditions, the HPCI or RCIC systems are assumed to provide adequate core cooling for several hours. Failure of the HPCI or RCIC systems is likely to result from battery depletion or extreme environmental conditions in that period of time. Sequences involving a loss of NSW for reasons other than a LOOP are much less important due to the substantial period of time available to provide cooling to the necessary components prior to failure. The staff considered the significance of a total loss of ESW, the likelihood of a concurrent LOOP and the AOTs for equipment designed to cope with an SBO event. The staff considered that the significance of the ESW pump to the SBO event was similar to that of the HPCI, RCIC and Automatic Depressurization System (ADS) systems, each of which has a 7-day AOT for a single inoperable component. The staff also noted that the proposed 7-day AOT for a single inoperable ESW pump was significantly more conservative than the current 30-day AOT. In making the above determination, the staff considered the ECW pump to be unavailable.

Based on the above analyses, the staff finds the proposed 7 day AOT for a single inoperable ESW pump acceptable. The staff also finds the proposed LCO requiring that the reactor be placed in hot shutdown within 6 hours and cold shutdown within 36 hours should both ESW pumps become inoperable to be consistent with the severity of the situation and, therefore, acceptable. Since the licensee has not conclusively demonstrated that the ECW pump and the associated FHS system is equivalent to an ESW pump in performing the ESW pump safety function, the staff considers the proposed deletion of the TS section

permitting establishment of ECW and ESW pump equivalency appropriate and finds the proposed change acceptable.

The proposed addition of a requirement to test the ECW and ESW booster pumps in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where relief has been granted, complies with the requirements of 10 CFR 50.55a with regard to inservice testing of ASME Code Class 2 and Class 3 pumps, and is acceptable. Based on licensee review of the test procedure, the proposed reduction of the STI for the ECT fans from once per operating cycle to once every three months introduces no additional unavailability for the EHS system. Since the proposed STI for the ECT fans increases the level of confidence in their proper operation without increasing unavailability and is consistent with the proposed STI for other active components in the EHS system, the staff finds the proposed change in the ECT fan STI acceptable.

The proposed addition of a surveillance test requirement for valve position verification is consistent with the guidance of the standard TSs and is, therefore, acceptable. The proposed addition of a surveillance test requirement to inspect and clean the ESW pump intake structure once every operating cycle complies, in part, with the recommendations of Generic Letter 89-13. Therefore, the staff finds the addition of this surveillance requirement acceptable.

4.0 SUMMARY

The proposed revision to the PBAPS TSs related to the ESW and EHS systems was reviewed and found to be acceptable. The acceptability of the proposed AOT for a single inoperable ESW pump was based on a staff review of the significance of a total loss of ESW, the likelihood of a concurrent LOOP and the AOT for other equipment needed to cope with an SBO event. The remaining proposed revisions to the PBAPS TSs were found to be acceptable based on various guidance documents and requirements, including the standard TSs. It should be noted that the proposed revisions, as a whole, result in TSs significantly more restrictive than the current TSs. The proposed changes to the TS Bases were found to accurately reflect the rationale for the proposed revisions to the PBAPS TSs and were, therefore, acceptable.

An editorial change was made to Technical Specifications pages 221, of Units 2 and 3, with the concurrence of the licensee, to add F to 120° to read 120°F. This change did not effect the original no significant hazards consideration.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (57 FR 4492). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: S. Jones
J. Shea

Date: September 15, 1992