PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

955-65 CHESTERBROOK BLVD.

WAYNE, PA 19087-5691

(215) 640-6000

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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Supplemental Response to Generic Letter 89-21 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3

REFERENCE: 1) Letter, J. W. Gallagher (PECo) to D. G. Eisenhut (NRC), dated January 21, 1981

2) Letter, S. L. Daltroff (PECo) to D. G. Eisenhut (NRC), dated June 30, 1983

3) Letter, J. W. Gallagher (PECo) to D. G. Eisenhut (NRC), dated September 29, 1983

Gentlemen:

This letter supplements the Philadelphia Electric Company (PECo) response (dated November 30, 1989) to Generic Letter 89-21, "Request For Information Concerning Status Of Implementation Of Unresolved Safety Issue (USI) Requirements." As a result of additional research which was determined to be necessary to fully comply with the Generic Letter, PECo has discovered that the information provided for USIs A-10 and A-42 relative to Peach Bottom Atomic Power Station needs to be revised.

USI A-42, Pipe Cracks in BWRs:

The following statement was erroneously included in Enclosure 4 of the Generic Letter response: "Pipe replacements at PBAPS, Units 2 and 3, are tentatively scheduled to be completed



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during the next refueling outage for each unit." This statement does not apply to PBAPS and is hereby withdrawn from the PECo response.

USI A-10, Feedwater Nozzles:

In response to NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking," PECo made commitments in the Reference 1 letter to do the following, as well as other actions:

1) Install a low-flow feedwater control valve;

2) Reroute the Reactor Water Cleanup (RWCU) discharge line to each of the Feedwater lines; and

3) Place Feedwater heaters in service during startups as soon as practical with the fifth heater valved into service at about 10% turbine load, the fourth heater at about 20%, and the third heater at approximately 25% turbine load.

The NRC accepted these commitments by letter dated June 10, 1981, T. M. Novak to E. G. Bauer. PECo has changed these three commitments, as previously discussed with the NRC Project Manager, and is hereby providing the rationale for these changes.

By the Reference 2 and Reference 3 letters (and reports attached therewith), PECo informed the NRC of its plans and provided justification for changing the first two commitments (low-flow controller and RWCU line reroute). The Reference 3 letter provided a fracture mechanics analysis demonstrating that without meeting the six strict characteristics for the low-flow controller required by the NUREG, the end-of-life Feedwater nozzle crack growth would be acceptably small. This variation from the six characteristics was permitted by NRC Generic Letter 81-11 issued February 20, 1981. The Reference 3 letter also provided an analysis demonstrating that the RWCU line reroute was not justified because the changes in fatigue usage factors at Peach Bottom would be minimal. Therefore, PECo stated that the reroute would not be done.

The report transmitted with the Reference 3 letter also stated that sufficient extraction steam pressure to place the fifth Feedwater heater in service normally does not exist until the turbine is loaded to 15%. Furthermore, in November 1986 PECo began the practice of placing the fifth Feedwater heater in service at approximately 18% turbine load.

All of these changes in PECo's commitments relative to minimizing Feedwater nozzle cracking have negligible influence on crack growth. Following the NUREG-0619 modifications to the nozzles and establishment of a new baseline (July 1980 - Unit 2, July 1981 - Unit 3), PECo implemented an inservice inspection program for the

Feedwater nozzles in accordance with Table 2 of the NUREG. This includes liquid penetrant (PT) inspections once every nine refueling cycles or 135 startup/shutdown cycles following the NUREG-0619 modifications to the nozzles. Currently, both Peach Bottom Units are in their third refueling cycle since the nozzle modifications. Unit 2 has undergone approximately 62 startup/shutdown cycles and Unit 3 has undergone approximately 41 startup/shutdown cycles since the nozzle modifications. The first NUREG-0619 Feedwater nozzle inspections were performed during the sixth refueling outage on each unit (Unit 2 outage ended in July 1985, Unit 3 outage ended in March 1986). Therefore, relative to Feedwater nozzles, PECo has complied with the intent of NUREG-0619 and Generic Letter 81-11.

USI A-10, Control Rod Drive (CRD) Return Line Nozzle:

In the Reference 1 letter PECo committed to performing post-modification testing on the Unit 3 CRD system in accordance with NUREG-0619. Similar testing had already been performed on Unit 2. PECo has not been able to confirm with documentation that such testing was performed on Unit 3; therefore, PECo presumes that the testing was not done.

The testing recommended by the NUREG consists of two parts, a flow test and a system performance test. The objective of the flow test was to demonstrate that concurrent two CRD pump operation could deliver coolant flow to the reactor vessel at normal operating pressure equivalent to the core boil-off rate (approximately 185 gpm). The objective of the system performance test (modeled after General Electric Document No. OPE-3-377, dated March 1977) was to demonstrate that numerous system parameters and system operational responses were normal.

The significance of not performing the flow test on Unit 3 is minimal. One of the principal motives for performing the flow test was that the 1975 Browns Ferry Unit 1 fire event demonstrated the safety benefit of the CRD System as a source of emergency cooling water. However, the implementation of 10 CFR 50, Appendix R requirements since then has negated that motive. In the event of a fire, the 10 CFR 50 Appendix R Safe Shutdown Methods rely on HPCI and RCIC, not the CRD System, to provide high pressure core coolant make-up. High pressure emergency core cooling with the CRD System is beyond the Peach Bottom licensing design basis and is not necessary to ensure nuclear safety. The CRD System is not a Q-listed cooling system. The High Pressure Coolant Injection (HPCI) System (5000 gpm) is the safety-related, Q-listed high pressure cooling system at Peach Bottom. The Reactor Core Isolation Cooling (RCIC) System is another source of high pressure coolant (600 gpm).

Our records indicate that the flow test conducted on Unit 2, without the return line to the vessel, revealed a flow through the CRDs in excess of 200 gpm at approximately 1000 psig reactor vessel pressure. The Unit 2 and Unit 3 CRD System designs and configurations are very similar and the systems are maintained similarly; hence, there is high assurance that the test results would have been the same on Unit 3. Therefore, PECo believes that performing the flow test on Unit 3 would provide a negligible increase in assurance of nuclear safety and is, therefore, not warranted.

The significance of not performing the system performance test is also minimal. The active safety function of the CRD System is to rapidly insert control rods into the reactor vessel on-demand. This function has been satisfactorily demonstrated numerous times since the modification was performed. The performance test was performed on Unit 3 prior to modifying the system, and the modification was not of a nature that it would change the results of the test. Additionally, the objectives of the performance test have been fulfilled since modifying the system by other tests and operations, as described below.

1) Control rods are regularly stroked as required by Technical Specifications at atmospheric pressure (Surveillance Test 10.8) and at normal operating pressure (Surveillance Test 9.2 and other procedures).

2) Adjustability of drive water pressure has been demonstrated by performance of procedure ON-106, "Stuck Rod Control."

3) Rods drifting in because of cooling water flow, incorrect settling of rods and unacceptable rod stroke times all are problems that would be identified by routine testing and operations.

4) Acceptable CRD temperatures and pressures are checked as part of the Plant Performance Monitoring Program. Sufficient cooling water flow, and control of system pressure has been demonstrated.

5) The CRD system has been in various operating conditions (shutdown, Refuel, Startup, Power Operation, vessel hydrostatic testing and scrams) and no system flow problems or CRD pump problems, such as excessive vibration or pump run-out, have occurred.

Therefore, PECo believes that performing this addition system performance test is not necessary and that nuclear safety is not affected.

USI A-10 Conclusion:

PECo believes that USI A-10 has been resolved at Peach Bottom. Therefore, for USI A-10 the completion date of August 1981 indicated in Enclosure 3 of the Generic Letter 89-21 response should be replaced with July 1985 for Unit 2 (first nozzle inspections) and the date of this letter for Unit 3.

If you have any questions, or require additional information, please do not hesitate to contact us.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger, Jr.
Director-Licensing
Nuclear Services Department

cc: J. J. Lyash, USNRC Senior Resident Inspector, PBAPS
W. T. Russell, Administrator, Region I, USNRC
G. Y. Suh, USNRC Project Manager