September 30, 1994

Docket Nos. 50-277
and 50-278

Mr. George A. Hunger, Jr.
Director-Licensing, MC 52A-5
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, Pennsylvania 19087-0195

Dear Mr. Hunger:

SUBJECT: SCRAM INSERTION TIMES, PEACH BOTTOM ATOMIC POWER STATION, UNIT NOS. 2 AND 3 (TAC NOS. M89617 AND M89618)

The Commission has issued the enclosed Amendments Nos. 197 and 200 to Facility Operating License Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Unit Nos. 2 and 3. These amendments consist of changes to the Technical Specifications (TS) in response to your application dated June 9, 1994 as supplemented by letter dated September 23, 1994.

These amendments revise the TS surveillance requirements for scram insertion times. Please inform the staff, in writing, when these amendments have been implemented.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,
/S/
Joseph W. Shea, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 197 to DPR-44
2. Amendment No. 200 to DPR-56
3. Safety Evaluation

cc w/enclosures:
See next page

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Docket File	MO'Brien(2)	CGrimes, O-11E21
NRC & Local PDRs	JShea	RJones, O-8E23
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SVarga	DHagan, 3206	OPA
JCalvo	GHill(4), P1-22	OC/LFDCB
MThadani	EWenzinger, RGN-I	CAnderson, RGN-I

OFC	:PDI-2/LA	:PDI-2/PM	:SRXB/BC	:OGC	:PDI-2/D	:
NAME	:MO'Brien	:JShea:tlc	:RJones for	:	:MThadani	:
DATE	:9/27/94	:9/27/94	: 9/26/94	:9/29/94	:9/30/94	:

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PDR ADOCK 05000277
P PDR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 30, 1994

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Dear Mr. Hunger:

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The Commission has issued the enclosed Amendments Nos. 197 and 200 to Facility Operating License Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Unit Nos. 2 and 3. These amendments consist of changes to the Technical Specifications (TS) in response to your application dated June 9, 1994 as supplemented by letter dated September 23, 1994.

These amendments revise the TS surveillance requirements for scram insertion times. Please inform the staff, in writing, when these amendments have been implemented.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

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Joseph W. Shea, Project Manager
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Enclosures:
1. Amendment No. 197 to DPR-44
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3. Safety Evaluation

cc w/enclosures:
See next page

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PHILADELPHIA ELECTRIC COMPANY

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 197
License No. DPR-44

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Philadelphia Electric Company, et al. (the licensee) dated June 9, 1994 as supplemented by letter dated September 23, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I.

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health or safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. DPR-44 is hereby amended to read as follows:

9410060141 940930
PDR ADOCK 05000277
P PDR

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 197 , are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James C. Stone

For Mohan C. Thadani, Acting Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 30, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 197

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Remove	Insert
103	103
104	104
111	111
112	112
113	113
133b	133b

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.B Control Rods (Cont'd.)	4.3.B Control Rods (Cont'd.)
4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.*	4. Prior to control rod withdrawal for startup or during refueling, verify that at least two source range channels have an observed count rate of at least three counts per second.*
5. During operation with limiting control rod patterns, as determined by the designated qualified personnel, either: a. Both RBM channels shall be operable, or b. Control rod withdrawal shall be blocked, or c. The operating power level shall be limited so that the MCPR will remain above the fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of a single operable control rod.	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s). * May be reduced provided at least three source range channels for startup or at least two source range channels for refueling have an observed count rate and a signal-to-noise ratio on or above the curve shown on Figure 3.3.1.
C. Scram Insertion Times	C. Scram Insertion Times
1. The average scram insertion time, based on the deenergization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than: % Inserted from Fully Withdrawn — Avg. Scram Insertion Times (sec) 5 — 0.375 20 — 0.90 50 — 2.0 90 — 3.5	1. After each refueling outage or after a reactor shutdown that is greater than 120 days, each control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power. Scram time testing is not required for control rods inserted per Specification 3.3.B.1.

LIMITING CONDITIONS FOR OPERATION

3.3.C (Cont'd)

2. The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (Sec)
5	0.398
20	0.954
50	2.120
90	3.8

3. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.

SURVEILLANCE REQUIREMENTS

4.3.C (Cont'd)

2. After any fuel movement within the reactor pressure vessel, only those control rods associated with the core cells affected by the fuel movements shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power.

3. At least once per 120 days of power operation, perform scram time testing for a representative sample of control rods with the reactor steam dome pressure greater than or equal to 800 psig.

4. Prior to declaring affected individual control rods operable after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested at any reactor steam dome pressure.

5. Prior to exceeding 40% of Rated Power after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig.

3.3 and 4.3 BASES (Cont'd)

C. Scram Insertion Times

The control rod system is designed to bring the reactor subcritical at a rate fast enough to prevent fuel damage; i.e., to prevent the MCPR from becoming less than the fuel cladding integrity safety limit. Analysis of the limiting power transients shows that the negative reactivity rates resulting from the scram with the average response of all drives as given in the above Specification, provide the required protection.

The numerical values assigned to the specified scram performance are based on the analysis of data from other BWR's with control rod drives the same as those on Peach Bottom.

The occurrence of scram times within the limits, but significantly longer than the average, should be viewed as an indication of a systematic problem with control rod drives especially if the number of drives exhibiting such scram times exceeds one control rod of a (5x5) twenty-five control rod array.

In the analytical treatment of the transients, which are assumed to scram on high neutron flux, 340 milliseconds are allowed between a neutron sensor reaching the scram point and the start of negative reactivity insertion. The 340 milliseconds used in the analyses consist of 140 milliseconds for sensor and circuit delay and 200 milliseconds to start of control rod motion. The 200 milliseconds are included in the allowable scram insertion times specified in Specification 3.3.C. In addition the control rod drop accident has been analyzed in NEDO-10527 and its supplements 1 & 2 for the scram times given in Specification 3.3.C.

Measurement of the scram times with reactor steam dome pressure greater than or equal to 800 psig demonstrates acceptable scram times for the transients analyzed in UFSAR, Appendix K, Section VI and UFSAR Chapter 14.

Maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure greater than 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time after fuel movement within the reactor pressure vessel or after a shutdown greater than or equal to 120 days or longer, all control rods are required to be tested before exceeding 40% of Rated Power following the shutdown. In the event fuel movement is limited to selected core cells, only those control rods associated with the core cells affected by the fuel movements are required to be scram time tested. However, if the reactor remains shutdown for greater than or equal to 120 days, all control rods are required to be scram time tested.

Amendment No. 24, 30, 48, 70, 197

3.3 and 4.3 BASES (Cont'd)

Additional testing once per 120 days of a sample of the control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The 120 day frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod operable.

Specific examples of work that could affect the scram times are (but are not limited to) the following: removal of any control rod drive for maintenance or modification; replacement of a control rod; and maintenance or modification of a scram solenoid pilot valve, scram valve, accumulator, isolation valve or check valve in the piping required for scram.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate each affected control rod is still within the limits with the reactor steam dome pressure greater than or equal to 800 psig. Where work has been performed at high reactor pressure, the requirements of 4.3.C.4 and 4.3.C.5 can be satisfied with one test. For a control rod affected by work performed while shut down; however, a zero pressure and high pressure test may be required. This testing ensures that, prior to withdrawing the control rod for continued operation, the control rod scram performance is acceptable for operating reactor pressure conditions. Alternatively, a control rod scram test during hydrostatic pressure testing could also satisfy both criteria.

Operability of the scram discharge volume vent and drain valves is necessary for maintaining a reservoir to contain the water exhausted from all control rod drives during a scram.

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LIMITING CONDITIONS FOR OPERATION

3.5.J Local LHGR (Cont'd)

If at any time during operation it is determined by normal surveillance that limiting value for LHGR is being exceeded, action shall be initiated within one (1) hour to restore LHGR to within prescribed limits. If the LHGR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless LHGR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

3.5.K Minimum Critical Power Ratio (MCPR)

1. During power operation the MCPR for the applicable incremental cycle core average exposure and for each type of fuel shall be equal to or greater than the value given in Specification 3.5.K.2 or 3.5.K.3, or MCPR(F), or the MCPR operating limit as determined by application of MCPR(P), whichever is greater. MCPR(F) and MCPR(P) are provided in the CORE OPERATING LIMITS REPORT. If at any time during operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall be initiated within one (1) hour to restore MCPR to within prescribed limits. If the MCPR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless MCPR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

SURVEILLANCE REQUIREMENTS

4.5.K Minimum Critical Power Ratio (MCPR)

1. MCPR shall be checked daily during reactor power operation at ≥25% rated thermal power.

2. Except as provided in Specification 3.5.K.3, the verification of the applicability of 3.5.K.2.a Operating Limit MCPR Values shall be performed every 120 operating days by scram time testing a representative sample of control rods and performing the following:

a. The average scram time to the 20% insertion position shall be:

$$\tau \text{ ave} \leq \tau \text{ B}$$

b. The average scram time to the 20% insertion position is determined as follows:

$$\tau \text{ ave} = \frac{\sum_{i=1}^{\eta} Ni \; \tau \; i}{\sum_{i=1}^{\eta} Ni}$$

where: n = number of surveillance tests performed to date in the cycle.

Amendment No 38, 48, 86, 134, 192, 197

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PHILADELPHIA ELECTRIC COMPANY

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-278

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 200
License No. DPR-56

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Philadelphia Electric Company, et al. (the licensee) dated June 9, 1994 as supplemented by letter dated September 23, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I.

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health or safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. DPR-56 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 200, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James C. Stone

For Mohan C. Thadani, Acting Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 30, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 200

FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Remove	Insert
103	103
104	104
111	111
112	112
113	113
133b	133b

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.B Control Rods (Cont'd.)	4.3.B Control Rods (Cont'd.)
4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.*	4. Prior to control rod withdrawal for startup or during refueling, verify that at least two source range channels have an observed count rate of at least three counts per second.*
5. During operation with limiting control rod patterns, as determined by the designated qualified personnel, either: a. Both RBM channels shall be operable, or b. Control rod withdrawal shall be blocked, or c. The operating power level shall be limited so that the MCPR will remain above the fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of a single operable control rod.	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s). * May be reduced provided at least three source range channels for startup or at least two source range channels for refueling have an observed count rate and a signal-to-noise ratio on or above the curve shown on Figure 3.3.1.
C. Scram Insertion Times	C. Scram Insertion Times
1. The average scram insertion time, based on the deenergization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than: % Inserted from Fully Withdrawn — Avg. Scram Insertion Times (sec) 5 — 0.375 20 — 0.90 50 — 2.0 90 — 3.5	1. After each refueling outage or after a reactor shutdown that is greater than 120 days, each control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power. Scram time testing is not required for control rods inserted per Specification 3.3.B.1.

LIMITING CONDITIONS FOR OPERATION

3.3.C (Cont'd)

2. The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (Sec)
5	0.398
20	0.954
50	2.120
90	3.8

3. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.

SURVEILLANCE REQUIREMENTS

4.3.C (Cont'd)

2. After any fuel movement within the reactor pressure vessel, only those control rods associated with the core cells affected by the fuel movements shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power.

3. At least once per 120 days of power operation, perform scram time testing for a representative sample of control rods with the reactor steam dome pressure greater than or equal to 800 psig.

4. Prior to declaring affected individual control rods operable after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested at any reactor steam dome pressure.

5. Prior to exceeding 40% of Rated Power after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig.

3.3 and 4.3 BASES (Cont'd)

C. Scram Insertion Times

The control rod system is designed to bring the reactor subcritical at a rate fast enough to prevent fuel damage; i.e., to prevent the MCPR from becoming less than the fuel cladding integrity safety limit. Analysis of the limiting power transients shows that the negative reactivity rates resulting from the scram with the average response to all drives as given in the above Specification, provide the required protection.

The numerical values assigned to the specified scram performance are based on the analysis of data from other BWR's with control rod drives the same as those on Peach Bottom.

The occurrence of scram times within the limits, but significantly longer than the average, should be viewed as an indication of a systematic problem with control rod drives especially if the number of drives exhibiting such scram times exceeds one control rod of a (5x5) twenty-five control array.

In the analytical treatment of the transients, which are assumed to scram on high neutron flux, 290 milliseconds are allowed between a neutron sensor reaching the scram point and the start of negative reactivity insertion. This is adequate and conservative when compared to the typical time delay of about-210 milliseconds estimated from scram test results. The 290 milliseconds used in the analyses consists of 90 milliseconds for sensor and circuit delay and 200 milliseconds to start of control rod motion. In addition the control rod drop accident has been analyzed in NEDO-10527 and its supplements 1 & 2 for the scram times given in Specification 3.3.C.

Measurement of the scram times with reactor steam dome pressure greater than or equal to 800 psig demonstrates acceptable scram times for the transients analyzed in UFSAR, Appendix K, Section VI and UFSAR Chapter 14.

Maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure greater than 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time after fuel movement within the reactor pressure vessel or after a shutdown greater than or equal to 120 days or longer, all control rods are required to be tested before exceeding 40% of Rated Power following the shutdown. In the event fuel movement is limited to selected core cells, only those control rods associated with the core cells affected by the fuel movements are required to be scram time tested. However, if the reactor remains shutdown for greater than or equal to 120 days, all control rods are required to be scram time tested.

3.3 and 4.3 BASES (Cont'd)

Additional testing once per 120 days of a sample of the control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The 120 day frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod operable.

Specific examples of work that could affect the scram times are (but are not limited to) the following: removal of any control rod drive for maintenance or modification; replacement of a control rod; and maintenance or modification of a scram solenoid pilot valve, scram valve, accumulator, isolation valve or check valve in the piping required for scram.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate each affected control rod is still within the limits with the reactor steam dome pressure greater than or equal to 800 psig. Where work has been performed at high reactor pressure, the requirements of 4.3.C.4 and 4.3.C.5 can be satisfied with one test. For a control rod affected by work performed while shut down; however, a zero pressure and high pressure test may be required. This testing ensures that, prior to withdrawing the control rod for continued operation, the control rod scram performance is acceptable for operating reactor pressure conditions. Alternatively, a control rod scram test during hydrostatic pressure testing could also satisfy both criteria.

Operability of the scram discharge volume vent and drain valves is necessary for maintaining a reservoir to contain the water exhausted from all control rod drives during a scram.

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LIMITING CONDITIONS FOR OPERATION

3.5.J Local LHGR (Cont'd)

If at any time during operation it is determined by normal surveillance that limiting value for LHGR is being exceeded, action shall be initiated within one (1) hour to restore LHGR to within prescribed limits. If the LHGR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless LHGR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

3.5.K Minimum Critical Power Ratio (MCPR)

1. During power operation the MCPR for the applicable incremental cycle core average exposure and for each type of fuel shall be equal to or greater than the value given in Specification 3.5.K.2 or 3.5.K.3, or MCPR(F), or the MCPR operating limit as determined by application of MCPR(P), whichever is greater. MCPR(F) and MCPR(P) are provided in the CORE OPERATING LIMITS REPORT. If at any time during operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall be initiated within one (1) hour to restore MCPR to within prescribed limits. If the MCPR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless MCPR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

SURVEILLANCE REQUIREMENTS

4.5.K Minimum Critical Power Ratio (MCPR)

1. MCPR shall be checked daily during reactor power operation at ≥25% rated thermal power.

2. Except as provided in Specification 3.5.K.3, the verification of the applicability of 3.5.K.2.a Operating Limit MCPR Values shall be performed every 120 operating days by scram time testing a representative sample of control rods and performing the following:

a. The average scram time to the 20% insertion position shall be:

$$\tau \text{ ave} \leq \tau \text{ B}$$

b. The average scram time to the 20% insertion position is determined as follows:

$$\tau \text{ ave} = \frac{\sum_{i=1}^{\eta} Ni\ \tau\ i}{\sum_{i=1}^{\eta} Ni}$$

where: n = number of surveillance tests performed to date in the cycle.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 197 AND 200 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 June 9, 1994, as supplemented by letter dated September 23, 1994, the Philadelphia Electric Company (the licensee) submitted a request for changes to the Peach Bottom Atomic Power Station, Unit Nos. 2 and 3, Technical Specifications (TS). The requested changes would revise the TS surveillance requirements for scram insertion times. The new TS wording is similar to the wording in NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4." The September 23, 1994, letter provided clarifying information and deleted the proposed inclusion of scram times as a function of low (< 800 psig) reactor pressure in the Core Operating Limits Report but did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The licensee has proposed the following changes:

1. Surveillance Requirements (SRs) 4.3.C, Scram Insertion Times, on TS pages 103 and 104:

   (1) Revise SR 4.3.C.1 to require that each control rod be scram time tested after each refueling outage or after a reactor shutdown that is greater than 120 days with reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of rated power. Scram time testing is not required for control rods inserted per Specification 3.3.B.1.

   (2) Replace SR 4.3.C.2 with the requirement to perform scram time testing with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of rated power for only those control rods associated with the core cells affected by any fuel movement within the reactor pressure vessel.

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(3) Add SR 4.3.C.3 to perform scram time testing for a representative sample of control rods at least once per 120 days of power operation with the reactor steam dome pressure greater than or equal to 800 psig.

(4) Add SR 4.3.C.4 to perform scram time testing at any reactor steam dome pressure for individual control rods prior to declaring them operable after work on the control rod or the control rod drive system is performed that could affect scram insertion time.

(5) Add SR 4.3.C.5 to perform scram time testing with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of rated power after work on the control rod or the control rod drive system that could affect scram insertion time.

2. TS BASES 3.3C and 4.3C on TS pages 111 through 113:

(1) Revise the bases to include bases information described in NUREG-1433.

(2) Delete all discussion of scram performance for Dresden 2 and 3 during pre-operational and startup testing.

3. SR 4.5.K.2 on TS page 133b

Revise the SR to perform scram time testing on a representative sample of control rods instead of on a rotational basis for 19 or more control rods.

3.0 EVALUATION

The proposed changes are similar to those delineated in NUREG-1433. The staff's rationale for approving the above changes is included in the applicable NUREG-1433 bases section. For completeness, relevant portions of the staff's rationale are repeated in the following paragraphs.

Regarding changes 1.(1) and (2) above, maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure > 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time following a refueling or after a shutdown ≥ 120 days or longer, all control rods are required to be tested before exceeding 40% of rated power following the shutdown. This frequency is acceptable considering the additional surveillances performed for control rod operability, the

sample of control rods at least once per 120 days of power operation with the reactor steam dome pressure greater than or equal to 800 psig.

(4) Add SR 4.3.C.4 to perform scram time testing at any reactor steam dome pressure for individual control rods prior to declaring them operable after work on the control rod or the control rod drive system is performed that could affect scram insertion time.

(5) Add SR 4.3.C.5 to perform scram time testing with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of rated power after work on the control rod or the control rod drive system that could affect scram insertion time.

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Regarding changes 1.(1) and (2) above, maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure > 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time following a refueling or after a shutdown ≥ 120 days or longer, all control rods are required to be tested before exceeding 40% of rated power following the shutdown. This frequency is acceptable considering the additional surveillances performed for control rod operability, the

frequent verification of adequate accumulator pressure, and the required testing of control rods affected by work on control rods or the control rod drive System. The proposed TS provide adequate assurance that control rod scram time will be verified after refueling outage or shutdowns of long duration and are, therefore, acceptable.

Regarding change 1.(3) above, additional testing of a sample of control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods with no more than 20% of the control rods in the sample "slow." The 120-day frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle. This frequency is also reasonable based on the additional surveillances done on the control rod drive mechanisms at more frequent intervals in accordance with SRs 4.3.A and 4.3.B.

Change 1.(4) implements a new surveillance requirement. The new SR requires performance of scram time testing after any work on the control rod drive system or control rod that could affect insertion time prior to declaring the rod operable. The maximum insertion time for operability (for 90% insertion) remains the same, 7-seconds, as in the existing TS. The 7-second operability standard is used to provide reasonable assurance that the rod will insert when required and has been accepted as an operability standard in the existing TS.

The low pressure scram time testing is not intended to demonstrate that control rod performance is adequate to ensure that safety limits are satisfied, which would be cause for inclusion in the TS as required by 10 CFR 50.36(c)(3). It is the "high pressure" (> 800 psig) scram time testing which demonstrates that control rod performance is such that the facility operation will remain within safety limits. The performance of "high pressure" scram time testing is required after each refueling outage or shutdown greater than 120 days, or periodically during sustained power operation or following any work on control rods or control rod drives that could affect scram insertion time. These requirements are articulated in proposed TS 4.3.C.1, TS 4.3.C.3 and 4.3.C.5. Thus, the use of low pressure scram time testing as part of an operability criteria, as proposed by the licensee in TS 4.3.C.4, but not for use in assuring conformance with safety limits, is acceptable to the staff.

Regarding change 1.(5) above, when work that could affect the scram insertion time is performed on a control rod or control rod drive system, testing must be done to demonstrate each affected control rod is still acceptable with the reactor steam dome pressure ≥ 800 psig. Where work has been performed at high reactor pressure, the requirements of SR 4.3.C.4 and SR 4.3.C.5 can be satisfied with one test. For a control rod affected by work performed while

shut down, however, a zero pressure and high pressure test may be required. This testing ensures that, prior to withdrawing the control rod for continued operation, the control rod scram performance is acceptable for operating reactor pressure conditions. Alternatively, a control rod scram test during hydrostatic pressure testing could also satisfy both criteria. The frequency of once prior to exceeding 40% of rated power is acceptable because of the capability to test the control rod over a range of operating conditions and the more frequent surveillances on other aspects of control rod operability. The proposed TS provide assurance that control rod scram time will be verified at operating conditions after control rod maintenance, and therefore, is acceptable.

Proposed change 2 above, incorporates the applicable bases discussion in NUREG-1433. Consistency between the SRs and their corresponding bases is necessary to avoid misinterpretations and to enhance the understanding of the intent of the requirements. Therefore, this change is acceptable.

Proposed change 3 changes SR 4.5.K.2 to make it consistent with the previously discussed revisions to SR 4.3.C.3 and TS Bases 3.2C and 4.3C. Therefore, this change is also acceptable.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a surveillance requirement. 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 (59 FR 37080). 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.

6.0 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.

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Date: September 30, 1994