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Amdt. 127
to DPR-56

September 22, 1987

Dockets Nos. 50-277/278

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MO'Brien(2)	JPartlow	

Mr. Edward G. Bauer, Jr.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

SUBJECT: RADWASTE TREATMENT SYSTEM FOR CHEMICAL AND OILY WASTES (TAC NOS. 64642 AND 64643)

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

The Commission has issued the enclosed Amendments Nos. 124 and 127 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 in response to your application dated December 17, 1986.

This amendment makes changes to Technical Specification page 207 to reflect the addition of a radwaste treatment sub-system to treat and filter chemical and oily wastes and also to make related editorial and format changes.

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/

Robert E. Martin, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 124 to DPR-44
2. Amendment No. 127 to DPR-56
3. Safety Evaluation

cc w/enclosures:
See next page

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MO'Brien	REMartin:ca		WButler
9/2/87	9/3/87	9/18/87	9/22/87

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

June 2, 1987

Dockets Nos. 50-277/278

Mr. Edward G. Bauer, Jr.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

SUBJECT: STANDBY LIQUID CONTROL SYSTEM (TAC NOS. 64543 AND 64544)

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

The Commission has issued the enclosed Amendment Nos. 122 and 126 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 in response to your application dated January 22, 1987, as supplemented by your letter of March 30, 1987.

These amendments revise the Technical Specifications on the Standby Liquid Control System to reflect modifications being made to Unit 2 during the current outage and similar modifications that will be made to Unit 3 during the next refueling outage (reload 7 for operation in cycle 8). The modifications are being made to meet the requirements of 10 CFR 50.62(c)(4) and to achieve more consistency with the BWR Standard Technical Specifications.

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,

Richard J. Clark

Richard J. Clark, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II

Enclosures:
1. Amendment No. 122 to DPR-44
2. Amendment No. 126 to DPR-56
3. Safety Evaluation

cc w/enclosures:
See next page

cc:
Troy B. Conner, Jr., Esq.
1747 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

Thomas A. Deming, Esq.
Assistant Attorney General
Department of Natural Resources
Annapolis, Maryland 21401

Philadelphia Electric Company
ATTN: Mr. D. M. Smith, Manager
Peach Bottom Atomic Power Station
Route 1, Box 208
Delta, Pennsylvania 17314

Mr. J. W. Gallagher, Vice President
Nuclear Operations
Philadelphia Electric Company
2301 Market Street
Philadlphia, Pennsylvania 19101

Mr. W. M. Alden
Engineer-In-Charge-Licensing
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. Anthony J. Pietrofitta, General Manager
Power Production Engineering
Atlantic Electric
P. O. Box 1500
1199 Black Horse Pike
Pleasantville, New Jersey 08232

Resident Inspector
U.S. Nuclear Regulatory Commission
Peach Bottom Atomic Power Station
P.O. Box 399
Delta, Pennsylvania 17314

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

Mr. R. A. Heiss, Coordinator
Pennsylvania State Clearinghouse
Governor's Office of State Planning
and Development
P.O. Box 1323
Harrisburg, Pennsylvania 17120

Mr. Thomas M. Gerusky, Director
Bureau of Radiation Protection
Pennsylvania Department of
Environmental Resources
P.O. Box 2063
Harrisburg, Pennsylvania 17120

Mr. Albert R. Steel, Chairman
Board of Supervisors
Peach Bottom Township
R. D. #1
Delta, Pennsylvania 17314

Mr. Gary Mock
P.O. Box 09181
Columbus, Ohio 43209

Mr. Thomas S. Shaw, Jr.
Vice President - Production
Delmarva Power and Light Company
800 King Street
Wilmington, Delaware 19899

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

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. 122
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 January 22, 1987, as supplemented by letter dated March 30, 1987, 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:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 122 , are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective for Unit 2 prior to startup in Cycle 8.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/
Walter R. Butler, Director
Project Directorate I-2
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1987

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MQuinlan	RClark:ca		WButler
6/1/87	05/19/87	5/15/87	6/2/87

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 122 , are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective for Unit 2 prior to startup in Cycle 8.

FOR THE NUCLEAR REGULATORY COMMISSION

Walter R. Butler

Walter R. Butler, Director
Project Directorate I-2
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 122

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.

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LIST OF FIGURES

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM	4.4 STANDBY LIQUID CONTROL SYSTEM
Applicability:	Applicability:
Applies to the operating status of the Standby Liquid Control System.	Applies to the surveillance requirements of the Standby Liquid Control System.
Objective:	Objective:
To assure the availability of a system with the capability to shutdown the reactor and maintain the shutdown condition without the use of control rods.	To verify the operability of the Standby Liquid Control System.
Specification:	Specification:
A. Normal System Availability	A. Normal System Availability
During periods when fuel is in the reactor and prior to startup from a Cold Condition, the Standby Liquid Control System shall be operable, except as specified by 3.4.C. This system need not be operable when the reactor is in the Cold Condition and Specification 3.3.A is met.	The operability of the Standby Liquid Control System is verified by the performance of the following tests: At least once during each operating cycle: 1. Check that the setting of the system relief valves is 1400 <P <1680 psig.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)
	2. Manually initiate one of the Standby Liquid Control System Pumps and pump demineralized water into the reactor vessel from the test tank. This test checks explosion of the charge associated with the tested loop, proper operation of the explosive valves, and pump operability. The replacement charges to be installed will be selected from the same manufactured batch as the tested charge.
	3. Both systems, including both explosive valves, shall be tested in the course of two operating cycles.
B. Normal System Requirements At all times when the Standby Liquid Control System is required to be operable, the following conditions shall be met:	B. Normal System Requirements
1. At least 162.7 lbm Boron-10 must be stored in the Standby Liquid Control Solution Tank and be available for injection.	1. Boron-10 Quantity: At least once per month calculate and record the quantity of Boron-10 stored in the Standby Liquid Control Solution Tank.
2. The sodium pentaborate solution concentration must be equal to or less than 9.82% weight.	2. Concentration: At least once per month check and record. Also, check concentration anytime water or boron is added to the solution.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)
3. The Standby Liquid Control System conditions must satisfy the following equation: $\left(\frac{C}{13\% \text{ wt.}}\right)\left(\frac{Q}{86 \text{ gpm}}\right)\left(\frac{E}{19.8\% \text{ atom}}\right) \geq 1$ where,	
C = Sodium Pentaborate Solution Concentration (% weight)	
Q = Pump Flow Rate (gpm) against a system head of 1225 psig.	3. Pump Flow Rate: At least once per month each pump loop shall be functionally tested by pumping boron solution to the test tank. At least once per quarter check and record pump flow rate against a system head of 1225 psig.
E = Boron-10 Enrichment (% atom Boron-10)	4. Enrichment: Following each addition of boron to the solution tank, calculate enrichment within 8 hours. Verify results by analysis within 30 days.
	5. Solution Volume: At least once per day check and record.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)

C. Operation with Inoperable Components

From and after the date that a redundant component is made or found to be inoperable, Specification 3.4.A shall be considered fulfilled and continued operation shall be permitted provided that the component is returned to to an operable condition within seven days. If this Specification cannot be met, the reactor shall be in Hot Shutdown within 12 hours and a Cold Shutdown Condition within the following 24 hours.

D. If Specification 3.4.A and 3.4.B cannot be met, the system shall be restored to an operable status within 8 hours or the reactor shall be placed in Hot Shutdown within the following 12 hours and in a Cold Shutdown Condition with all operable control rods fully inserted within the following 24 hours.

3.4 BASES

STANDBY LIQUID CONTROL SYSTEM

A. The conditions under which the Standby Liquid Control System must provide shutdown capability are identified in the Plant Nuclear Safety Operational Analysis (UFSAR Appendix G). If no more than one operable control rod is withdrawn, the basic shutdown reactivity requirement for the core is satisfied and the Standby Liquid Control System is not required. Thus, the basic reactivity requirement for the core is the primary determinant of when the Standby Liquid Control System is required.

The purpose of the Standby Liquid Control System is to provide the capability of bringing the reactor from full power to a cold, xenon-free shutdown condition assuming that none of the withdrawn control rods can be inserted. To meet this objective, the Standby Liquid Control System is designed to inject a sufficient quantity of Boron-10 (the boron isotope with the high neutron cross-section) to bring the reactor from full power to a subcritical condition, considering the hot to cold reactivity difference, xenon poisoning, etc.

The minimum limitation on the relief valve setting is intended to prevent the recycling of boron solution via the lifting of a relief valve at too low a pressure. The upper limit on the relief valve setting provides system protection from overpressure.

The only practical time to fully test the Standby Liquid Control System is during a refueling outage. Various components of the system are individually tested periodically, thus making more frequent testing of the entire system unnecessary.

B. In order to satisfy the purpose of the Standby Liquid Control System, a sufficient quantity of Boron-10 must be stored and be available for injection into the reactor vessel. The quantity of Boron-10 required to be stored is sufficient to bring the concentration of Boron-10 in the reactor to the point where the reactor will be shutdown and to provide an additional 25 percent margin beyond the amount needed to shutdown the reactor to allow for possible imperfect mixing of the chemical solution in the reactor water.

By limiting the sodium pentaborate solution concentration to equal to or less than 9.82% weight, the solution saturation temperature is limited to below 53 degrees F (including a 10 degrees F margin). Since the ambient temperature is anticipated to always be greater than 53 degrees F, the system pump tests can be conducted by recirculating solution from the Standby Liquid Control Solution Tank without concern over the solution precipitating in the piping, pumps, and valves.

3.4 BASES

STANDBY LIQUID CONTROL SYSTEM

The Standby Liquid Control System is also required to meet 10 CFR 50.62 (Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants). The Standby Liquid Control System must have the equivalent control capacity of an 86 gpm system of 13% weight natural sodium pentaborate in order to satisfy 10 CFR 50.62 requirements. This equivalency requirement is fulfilled by having a system which satisfies the equation given in 3.4.B.3. Each parameter (sodium pentaborate solution concentration, pump flow rate, and Boron-10 enrichment) is tested at an interval consistent with the potential for that parameter to vary and also to assure proper equipment performance. Boron-10 enrichment testing is only required when chemical addition occurs since change cannot occur by any process other than the addition of new chemicals to the Standby Liquid Control Solution Tank.

The enriched sodium pentaborate solution is made by combining natural borax and Boron-10 enriched boric acid in stoichiometric quantities in demineralized water. Since both the borax and Boron-10 enriched boric acid have known Boron-10 enrichments, the resulting Boron-10 enriched sodium pentaborate also has a known Boron-10 enrichment. This process is adequate for use in determining immediate compliance with 3.4.B.3 following chemical addition. The solution Boron-10 enrichment shall be subsequently verified by analysis to be acceptable.

The volume of solution stored is checked at a frequency to assure high reliability of the system. Solution level is indicated and alarmed in the control room.

C. Only one of the two Standby Liquid Control pumping loops is needed for operating the system. One inoperable pumping circuit does not immediately threaten shutdown capability, and reactor operation can continue while the circuit is being repaired.

4.4 BASES

STANDBY LIQUID CONTROL SYSTEM

The bases for the surveillance requirements and the details of the various tests are given in Subsection 3.8.5 of the Updated Final Safety Analysis Report.

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

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. 126
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 January 22, 1987, as supplemented by letter dated March 30, 1987, 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. 126, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective for Unit 3 prior to startup in Cycle 8.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/
Walter R. Butler, Director
Project Directorate I-2
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1987

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MO'Brien	RClark:ea		WButler
6/1/87	05/19/87	5/25/87	6/2/87

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 126, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective for Unit 3 prior to startup in Cycle 8.

FOR THE NUCLEAR REGULATORY COMMISSION

Walter R. Butler

Walter R. Butler, Director
Project Directorate I-2
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 126

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.

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LIST OF FIGURES

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM	4.4 STANDBY LIQUID CONTROL SYSTEM
Applicability:	Applicability:
Applies to the operating status of the Standby Liquid Control System.	Applies to the surveillance requirements of the Standby Liquid Control System.
Objective:	Objective:
To assure the availability of a system with the capability to shutdown the reactor and maintain the shutdown condition without the use of control rods.	To verify the operability of the Standby Liquid Control System.
Specification:	Specification:
A. Normal System Availability	A. Normal System Availability
During periods when fuel is in the reactor and prior to startup from a Cold Condition, the Standby Liquid Control System shall be operable, except as specified by 3.4.C. This system need not be operable when the reactor is in the Cold Condition and Specification 3.3.A is met.	The operability of the Standby Liquid Control System is verified by the performance of the following tests: At least once during each operating cycle: 1. Check that the setting of the system relief valves is 1400 <P <1680 psig.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)
	2. Manually initiate one of the Standby Liquid Control System Pumps and pump demineralized water into the reactor vessel from the test tank. This test checks explosion of the charge associated with the tested loop, proper operation of the explosive valves, and pump operability. The replacement charges to be installed will be selected from the same manufactured batch as the tested charge.
	3. Both systems, including both explosive valves, shall be tested in the course of two operating cycles.
B. Normal System Requirements At all times when the Standby Liquid Control System is required to be operable, the following conditions shall be met:	B. Normal System Requirements
1. At least 162.7 lbm Boron-10 must be stored in the Standby Liquid Control Solution Tank and be available for injection.	1. Boron-10 Quantity: At least once per month calculate and record the quantity of Boron-10 stored in the Standby Liquid Control Solution Tank.
2. The sodium pentaborate solution concentration must be equal to or less than 9.82% weight.	2. Concentration: At least once per month check and record. Also, check concentration anytime water or boron is added to the solution.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)
3. The Standby Liquid Control System conditions must satisfy the following equation: $\left(\frac{C}{13\% \text{ wt.}}\right)\left(\frac{Q}{86 \text{ gpm}}\right)\left(\frac{E}{19.8\% \text{ atom}}\right) \geq 1$ where, C = Sodium Pentaborate Solution Concentration (% weight)	
Q = Pump Flow Rate (gpm) against a system head of 1225 psig.	3. Pump Flow Rate: At least once per month each pump loop shall be functionally tested by pumping boron solution to the test tank. At least once per quarter check and record pump flow rate against a system head of 1225 psig.
E = Boron-10 Enrichment (% atom Boron-10)	4. Enrichment: Following each addition of boron to the solution tank, calculate enrichment within 8 hours. Verify results by analysis within 30 days. 5. Solution Volume: At least once per day check and record.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)	4.4 STANDBY LIQUID CONTROL SYSTEM (Cont'd.)
C. Operation with Inoperable Components From and after the date that a redundant component is made or found to be inoperable, Specification 3.4.A shall be considered fulfilled and continued operation shall be permitted provided that the component is returned to to an operable condition within seven days. If this Specification cannot be met, the reactor shall be in Hot Shutdown within 12 hours and a Cold Shutdown Condition within the following 24 hours.	
D. If Specification 3.4.A and 3.4.B cannot be met, the system shall be restored to an operable status within 8 hours or the reactor shall be placed in Hot Shutdown within the following 12 hours and in a Cold Shutdown Condition with all operable control rods fully inserted within the following 24 hours.	

BASES

STANDBY LIQUID CONTROL SYSTEM

A. The conditions under which the Standby Liquid Control System must provide shutdown capability are identified in the Plant Nuclear Safety Operational Analysis (UFSAR Appendix G). If no more than one operable control rod is withdrawn, the basic shutdown reactivity requirement for the core is satisfied and the Standby Liquid Control System is not required. Thus, the basic reactivity requirement for the core is the primary determinant of when the Standby Liquid Control System is required.

The purpose of the Standby Liquid Control System is to provide the capability of bringing the reactor from full power to a cold, xenon-free shutdown condition assuming that none of the withdrawn control rods can be inserted. To meet this objective, the Standby Liquid Control System is designed to inject a sufficient quantity of Boron-10 (the boron isotope with the high neutron cross-section) to bring the reactor from full power to a subcritical condition, considering the hot to cold reactivity difference, xenon poisoning, etc.

The minimum limitation on the relief valve setting is intended to prevent the recycling of boron solution via the lifting of a relief valve at too low a pressure. The upper limit on the relief valve setting provides system protection from overpressure.

The only practical time to fully test the Standby Liquid Control System is during a refueling outage. Various components of the system are individually tested periodically, thus making more frequent testing of the entire system unnecessary.

B. In order to satisfy the purpose of the Standby Liquid Control System, a sufficient quantity of Boron-10 must be stored and be available for injection into the reactor vessel. The quantity of Boron-10 required to be stored is sufficient to bring the concentration of Boron-10 in the reactor to the point where the reactor will be shutdown and to provide an additional 25 percent margin beyond the amount needed to shutdown the reactor to allow for possible imperfect mixing of the chemical solution in the reactor water.

By limiting the sodium pentaborate solution concentration to equal to or less than 9.82% weight, the solution saturation temperature is limited to below 53 degrees F (including a 10 degrees F margin). Since the ambient temperature is anticipated to always be greater than 53 degrees F, the system pump tests can be conducted by recirculating solution from the Standby Liquid Control Solution Tank without concern over the solution precipitating in the piping, pumps, and valves.

3.4 BASES

STANDBY LIQUID CONTROL SYSTEM

The Standby Liquid Control System is also required to meet 10 CFR 50.62 (Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants). The Standby Liquid Control System must have the equivalent control capacity of an 86 gpm system of 13% weight natural sodium pentaborate in order to satisfy 10 CFR 50.62 requirements. This equivalency requirement is fulfilled by having a system which satisfies the equation given in 3.4.B.3. Each parameter (sodium pentaborate solution concentration, pump flow rate, and Boron-10 enrichment) is tested at an interval consistent with the potential for that parameter to vary and also to assure proper equipment performance. Boron-10 enrichment testing is only required when chemical addition occurs since change cannot occur by any process other than the addition of new chemicals to the Standby Liquid Control Solution Tank.

The enriched sodium pentaborate solution is made by combining natural borax and Boron-10 enriched boric acid in stoichiometric quantities in demineralized water. Since both the borax and Boron-10 enriched boric acid have known Boron-10 enrichments, the resulting Boron-10 enriched sodium pentaborate also has a known Boron-10 enrichment. This process is adequate for use in determining immediate compliance with 3.4.B.3 following chemical addition. The solution Boron-10 enrichment shall be subsequently verified by analysis to be acceptable.

The volume of solution stored is checked at a frequency to assure high reliability of the system. Solution level is indicated and alarmed in the control room.

C. Only one of the two Standby Liquid Control pumping loops is needed for operating the system. One inoperable pumping circuit does not immediately threaten shutdown capability, and reactor operation can continue while the circuit is being repaired.

4.4 BASES

STANDBY LIQUID CONTROL SYSTEM

The bases for the surveillance requirements and the details of the various tests are given in Subsection 3.8.5 of the Updated Final Safety Analysis Report.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENT NOS. 122 AND 126 TO FACILITY OPERATING

LICENSE NOS. DPR-44 and DPR-56

PHIADELPHIA 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 letters dated January 22, 1987 and March 30, 1987, Philadelphia Electric Company (PECO), the licensee, requested changes to the Technical Specifications with regard to the Standby Liquid Control System (SLCS). The proposed changes reflect the licensee's plan to enrich the Boron in the sodium pentaborate. This increase in Boron-10 enrichment is proposed to satisfy the requirements of ATWS Rule 10 CFR 50.62(c)(4). The licensee is proposing to include the following equation:

$$\frac{C}{13\% \text{ wt}} * \frac{Q}{86 \text{ gpm}} * \frac{E}{19.8\% \text{ atom}} \quad 1$$

in the LCO section of the Technical Specifications. Pump flow rate (Q) against a system head of 1225 psig, Boron-10 enrichment (E) and sodium pentaborate concentration (C) are all considered as a group to determine whether Peach Bottom, with a vessel diameter of 251", satisfies the requirements of the ATWS Rule 10 CFR 50.62(c)(4). The three variables give the licensee more flexibility. Since the ATWS Rule is met by satisfying the equation, the individual requirements for each parameter are deleted in the proposed Technical Specifications.

2.0. EVALUATION

The licensee is proposing a major revision of the SLCS Technical Specifications. The description of the changes and reasons for the changes are listed below:

a. Existing LCO 3.4.A.1 states that the SLCS "need not be operable when the reactor is in the Cold Condition and all control rods are fully inserted and Specification 3.3.A is met. The licensee proposed to remove the words ..."and all control rods are fully inserted"... because it is superfluous to Specification 3.3.A. Specification 3.3.A specifies the minimum required shutdown reactivity margin. The revised LCO 3.4.A states that the SLCS "need not be operable when the reactor is in the cold condition and specification 3.3.A is met." This is acceptable.

b. It is proposed that the requirement to functionally test each pump loop once per month be moved from existing Surveillance Requirement 4.4.A.1 to 4.4.B.3, to "line up" with the location of pump flow rate in the LCO column. Proposed Surveillance Requirement 4.4.B.3 requires that "At least once per month, each pump loop shall be functionally tested by pumping boron solution to the test tank." This requirement differs from the existing requirement, 4.4.A.1, in that the boron solution itself, instead of demineralized water, is pumped. Presently, demineralized water is pumped during the monthly test, in accordance with 4.4.A.1, instead of the boron solution because the boron could precipitate out of the solution if left in the pump loop since the pump discharge piping temperature is not always maintained above the saturation temperature of the solution. This is not a concern with the new solution, however, because its saturation temperature is maintained at 43 degrees F which is below the minimum anticipated ambient and solution temperatures. The Standby Liquid Control System is located in the Reactor Building. As discussed on page 15 of the licensee's January 22, 1987 submittal, the SLCS area is normally maintained at about 65°F. There is an alarm in the control room if the ambient temperature drops to 55°F. Also, the tank is equipped with a heater and there is heat tracing on the lines. Consequently, the requirement to flush the system piping with demineralized water after pumping boron solution, in existing Surveillance Requirement 4.4.A.2.b, is no longer necessary and is being removed. This is acceptable.

c. It is proposed that existing Surveillance Requirement 4.4.A.2.b be replaced by proposed Surveillance Requirement 4.4.B.3. Existing Surveillance Requirement 4.4.A.2.b requires that the system be manually initiated, except explosive valves, and boron solution be recirculated to the solution tank, and that a "Minimum pump flow rate of 43 gpm against a system head of 1225 psig" be verified at least once per operating cycle. Proposed Surveillance Requirement 4.4.B.3 requires that pump flow rate be checked and recorded at least once per quarter, and that the system be functionally tested by pumping boron solution at least once per month, as compared to the existing once-per-operating-cycle requirement. As discussed in Section 1 of this SER, the value of pump flow rate need not be 43 gpm or greater due to the properties of the new solution. The SLCS can meet its objective and satisfy the requirements of 10 CFR Section 50.62(c)(4) with the new solution at a flow rate of less than 43 gpm as long as the ratio expression of proposed LCO 3.4.A.3 is satisfied. The pump flow rate that will be used in the equation will be the rate determined in the quarterly test. This is acceptable.

d. Several of the Surveillance Requirements and the types of LCOs presently contained in the section titled "Sodium Pentaborate Solution", 3.4.C and 4.4.C, are proposed to be placed in a new section titled "Normal System Requirements", 3.4.B and 4.4.B. Consequently, it is proposed that the existing material in Sections 3.4.C and 4.4.C be removed. The revised LCOs and Surveillance Requirements reflect the new solution properties. The change in format is being proposed to group all of the operability requirements together (equipment and solution). The changes are discussed individually below. The proposed LCOs and Surveillance Requirements in the new "Normal System Requirements" section ensure that the SLCS is operable, as do existing Specifications 3.4.C and 4.4.C.

1. Presently, LCO 3.4.C.1, by reference to Figure 3.4.1, establishes the volume and sodium pentaborate concentration limits on the control solution to ensure that sufficient Boron-10 is available for injection to meet the system's objectives. Similarly, proposed LCO 3.4.B.1 establishes the minimum mass of Boron-10 that must be available to meet the system's objectives (including a 25% margin). Proposed Surveillance Requirement 4.4.B.1 requires the mass of Boron-10 to be calculated at least once per month. Proposed Surveillance Requirement 4.4.B.5 requires volume to be checked and recorded at least once per day as currently required by Surveillance Requirement 4.4.C.1. Proposed Surveillance Requirement 4.4.B.2 requires sodium pentaborate concentration to be checked and recorded at least once per month, or anytime water or Boron is added to the solution, as currently required by Surveillance Requirement 4.4.C.3. These proposed Surveillance Requirements, combined with proposed Surveillance Requirement 4.4.B.4 concerning Boron-10 enrichment, provide the data to calculate the mass of Boron-10 in the tank. This is acceptable.

2. Proposed LCO 3.4.B.3 establishes an algebraic expression by which operability of the SLCS is determined. Because the new solution is enriched in Boron-10, a new parameter, Boron-10 enrichment, is considered. The expression contains the three system parameters of concern: concentration (C), flow rate (Q), and enrichment (E). Each of these variables is divided by its corresponding value in the criteria set forth in 10 CFR Section 50.62(c)(4) to form an expression of three ratios. 10 CFR Section 50.62(c)(4) requires a SLCS "with a minimum flow capacity and Boron content equivalent in control capacity to 86 gallons per minute of 13 weight percent sodium pentaborate solution." Natural sodium pentaborate solution is 19.8% atom Boron-10. Therefore, the expression is a multiple of ratios as follows:

$$\frac{C}{13\%\ \text{wt}} * \frac{Q}{86\ \text{gpm}} * \frac{E}{19.8\%\ \text{atom}}$$

If this product is equal to or greater than 1.0, the SLCS satisfies the criteria of 10 CFR Section 50.62(c)(4). For example, (1) if Q = 50 gpm and C = 9.82% weight, the criteria of 10 CFR Section 50.62(c)(4) is satisfied as long as E is equal to or greater than 45.09% atom, or (2) if Q = 40 gpm and C = 9.15% weight, the criteria of 10 CFR 50.62(c)(4) is satisfied as long as E is equal to or greater than 60.49% atom. Thus, it can be seen that the individual value of C, Q or E does not, alone, determine operability of the SLCS. Rather, these variables must be considered as a group. By using the expression of proposed LCO 3.4.B.3, the conditions of the SLCS are directly and accurately compared with the criteria of 10 CFR Section 50.62(c)(4). This is acceptable.

3. Proposed Surveillance Requirement 4.4.B.4 is being added to ensure that the Boron-10 enrichment of the solution is known. Proper Boron-10 enrichment is established by mixing stoichiometric quantities of borax and boric acid, both being of known Boron-10 enrichment. Thorough mixing of the chemicals is ensured by using the "air bubbler" in the tank. Proposed Surveillance Requirement 4.4.B.4 requires that Boron-10 enrichment be calculated following each Boron addition to the solution. A sample will be required to be analyzed within 30 days to provide assurance that the solution was mixed properly and has adequate Boron-10 enrichment. This proposed requirement concerning mass, concentration and volume ensure that sufficient Boron-10 is available to meet the system's objectives. This is acceptable.

4. As discussed before, solution saturation temperature is maintained well below normal ambient temperature by not exceeding 9.82 weight percent sodium pentaborate concentration as required by proposed LCO 3.4.B.2. Therefore, existing LCO 3.4.C.2 and Figure 3.4.2 which establish temperature requirements for the solution are no longer appropriate and can be deleted.

5. The requirement to check and record solution temperature, existing Surveillance Requirement 4.4.C.2, can be deleted because proposed Surveillance Requirement 4.4.B.2, which requires checking and recording sodium pentaborate concentration, assures that the solution saturation temperature remains below normal ambient temperature. Also, the requirement, in existing Surveillance Requirement 4.4.C.3, to check and record sodium pentaborate concentration when solution temperature is below the temperature required in Figure 3.4.2 can be deleted because Figure 3.4.2 is being removed and the monitoring of sodium pentaborate concentration is assured by proposed Surveillance Requirement 4.4.B.2. This is acceptable.

6. Existing LCO 3.4.B.1 is renumbered 3.4.C and an action statement requiring the reactor to be in Hot Shutdown within 12 hours if the redundant component is inoperable for 7 days, and a Cold Shutdown Condition within the following 24 hours is being added. Presently, the action statement of existing LCO 3.4.D, which requires the reactor to be in a Cold Shutdown Condition within 24 hours, applies to this specification. This is acceptable because it is consistent with the standard Technical Specification NUREG-0123, Rev. 3.

7. It is proposed that the action statement of existing LCO 3.4.D be revised to be more consistent with the Standard Technical Specifications for General Electric Boiling Water Reactors, NUREG-0123, Revision 3 (Specification 3.1.5.a). Revised LCO 3.4.D allows 8 hours for restoring the SLCS to an operable status before requiring a shutdown, and the reactor must be in Hot Shutdown within the following 12 hours. For conservatism, the licensee proposed an

additional restriction not included in the Standard Technical Specifications in LCO 3.4.D-namely, that a Cold Shutdown Condition must be achieved within 24 hours following Hot Shutdown. Although this additional conservatism is not considered necessary by the staff, the change was accepted as submitted.

e. It is proposed that existing Surveillance Requirement 4.4.B.1 be removed. This Specification (4.4.B.1) requires that "When a component is found to be inoperable, its redundant component shall be demonstrated to be operable immediately and daily thereafter ...." This deletion is consistent with the Standard Technical Specifications for General Electric Boiling Water Reactors, NUREG-0123, Revision 3, and hence is acceptable.

The Bases Section 3.4 was revised to reflect the proposed changes. The revised Bases are acceptable since it adequately explains the bases for the current requirements in the technical specifications.

3.0 ENVIRONMENTAL CONSIDERATIONS

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The 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. 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.

4.0. CONCLUSION

The Technical Specification changes proposed by the licensee are acceptable because they are consistent with the requirements of 10 CFR 50.62(c)(4). The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations and 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 Contributor: G. Thomas

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