

May 31, 1988

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: DIESEL GENERATOR FUEL OIL: REGULATORY GUIDE 1.137  
(TAC NOS. 47379 AND 47380)

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

The Commission has issued the enclosed Amendments Nos. 131 and 134 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 October 1, 1981 as supplemented and amended on November 15, 1984, November 24, 1986, September 2 and November 18, 1987, and March 30, 1988.

These amendments revise the Technical Specifications 4.9.A, 3.9.B and the BASES for diesel generator fuel oil in response to the guidance in Regulatory Guide 1.137, "Fuel Oil Systems for Standby Diesel Generators."

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. 131 to DPR-44
- 2. Amendment No. 134 to DPR-56
- 3. Safety Evaluation

cc w/enclosures:  
See next page

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PDR ADOCK 05000277  
PDR

PDI/BA  
MO'Brien  
5/10/88

PDI-2/PM  
REMartin:mr  
4/28/88

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5/20/88

PDI-2/D  
WButler  
5/27/88

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

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Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19101

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SUBJECT: DIESEL GENERATOR FUEL OIL: REGULATORY GUIDE 1.137  
(TAC NOS. 47379 AND 47380)

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

The Commission has issued the enclosed Amendments Nos. 131 and 134 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 October 1, 1981 as supplemented and amended on November 15, 1984, November 24, 1986, September 2 and November 18, 1987, and March 30, 1988.

These amendments revise the Technical Specifications 4.9.A, 3.9.B and the BASES for diesel generator fuel oil in response to the guidance in Regulatory Guide 1.137, "Fuel Oil Systems for Standby Diesel Generators."

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,

A handwritten signature in cursive script that reads "Robert E. Martin".

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

Enclosures:

1. Amendment No. 131 to DPR-44
2. Amendment No. 134 to DPR-56
3. Safety Evaluation

cc w/enclosures:  
See next page

Mr. E. G. Bauer, Jr.  
Philadelphia Electric Company

Peach Bottom Atomic Power Station,  
Units 2 and 3

cc:

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Pennsylvania Department of  
Environmental Resources  
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Department of Environment  
201 West Preston Street  
Baltimore, Maryland 21201



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. 131  
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 October 1, 1981 as supplemented and amended on November 15, 1984, November 24, 1986, September 2 and November 18, 1987, and March 30, 1988, 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:

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PDR ADDCK 05000277  
P PDR

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 131, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective six months from the date of issuance to accommodate revisions to plant procedures and test equipment requirements.

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: May 31, 1988

PDI-2/LA  
MO'Brien  
5/10/88

PDI-2/PM  
REMartin:mr  
4/28/88

OGC  
S. G. [Signature]  
5/27/88

PDI-2/D  
WButler  
5/27/88

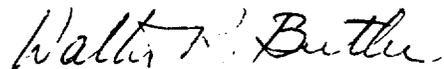
WB

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 131, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective six months from the date of issuance to accommodate revisions to plant procedures and test equipment requirements.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 31, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 131

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. Asterisk pages are provided to maintain document completeness.

<u>Remove</u>	<u>Insert</u>
217	217*
218	218
218a	218a
-	218b
-	218c
-	220a
223	223*
224	224

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
<p data-bbox="332 300 868 331"><b>3.9 <u>AUXILIARY ELECTRICAL SYSTEM</u></b></p> <p data-bbox="397 352 641 384"><u>Applicability:</u></p> <p data-bbox="397 411 812 468">Applies to the auxiliary electrical power system.</p> <p data-bbox="397 525 568 556"><u>Objective:</u></p> <p data-bbox="397 583 885 699">To assure an adequate supply of electrical power for operation of those systems required for safety.</p> <p data-bbox="397 726 641 758"><u>Specification:</u></p> <p data-bbox="332 783 917 814"><b>A. <u>Auxiliary Electrical Equipment</u></b></p> <p data-bbox="397 867 901 982">The reactor shall not be made critical unless all of the following conditions are satisfied:</p> <ol data-bbox="332 1010 885 1612" style="list-style-type: none"> <li data-bbox="332 1010 885 1209">1. Both off-site sources and the startup transformers and emergency transformers are available and capable of automatically supplying power to the 4kV emergency buses.</li> <li data-bbox="332 1241 885 1381">2. The four diesel generators shall be operable and there shall be a minimum of 104,000 gal. of diesel fuel on site.</li> <li data-bbox="332 1413 885 1497">3. The 4kV emergency buses and the 480V emergency load centers are energized.</li> <li data-bbox="332 1528 885 1612">4. The four unit 125V batteries and their chargers shall be operable.</li> </ol>	<p data-bbox="1015 300 1550 331"><b>4.9 <u>AUXILIARY ELECTRICAL SYSTEM</u></b></p> <p data-bbox="1079 352 1323 384"><u>Applicability:</u></p> <p data-bbox="1079 411 1583 506">Applies to the periodic testing requirements of the auxiliary electrical systems.</p> <p data-bbox="1079 525 1258 556"><u>Objective:</u></p> <p data-bbox="1079 583 1583 646">Verify the operability of the auxiliary electrical system.</p> <p data-bbox="1079 726 1323 758"><u>Specification:</u></p> <p data-bbox="1015 783 1550 846"><b>A. <u>Auxiliary Electrical Equipment</u></b></p> <ol data-bbox="1015 1010 1599 1612" style="list-style-type: none"> <li data-bbox="1015 1010 1599 1612">1. Diesel Generators <ol data-bbox="1031 1073 1599 1272" style="list-style-type: none"> <li data-bbox="1031 1073 1599 1272">a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue for at least a one hour period at rated load.</li> </ol> <p data-bbox="1079 1297 1583 1612">During the monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall be demonstrated, and the diesel starting time to reach rated voltage and frequency shall be logged.</p> </li> </ol>

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

- b. Once per operating cycle the condition under which the diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The results shall be logged.
- c. Once a month the quantity of diesel fuel available shall be logged.
- d. Accumulated water shall be removed:
  - 1) From the day tanks at least once every 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
  - 2) From the main storage tanks at least once every 31 days.

If it is suspected that water has entered the suction piping from the day tank, the entire fuel oil system between the day tank and the injectors shall be flushed.

- e. New fuel oil shall be sampled in accordance with ASTM D4057-81 prior to addition to the main storage tanks and:
  - 1) In accordance with the tests specified in ASTM D975-81 prior to addition to the main storage tanks, it shall be verified that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60 degrees F or a specific gravity of within 0.0016 at 60/60 degrees F, when compared to the supplier's certificate; or an absolute specific

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

gravity at 60/60 degrees F of greater than or equal to 0.83 but less than or equal to 0.89; or an API gravity at 60 degrees F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

b) A kinematic viscosity at 40 degrees C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.

c) A flash point equal to or greater than 125 degrees F, and

d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.

2) Within 31 days of obtaining the sample, it shall be verified that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

f. At least once every 31 days a sample of fuel oil shall be obtained from the main storage tanks in accordance with ASTM D2276-78, and it shall be verified that total particulate

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.

- g. Each fuel oil storage tank shall be drained, accumulated sediment removed, and the tanks cleaned using a sodium hypochlorite or equivalent solution, at least once every ten years.
- h. The fuel oil storage tank cathodic protection system shall be checked as follows:
  - 1) At least once every twelve months perform a test to determine whether the cathodic protection is adequate, and
  - 2) At least once every two months inspect the cathodic protection rectifiers.

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

- j. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.

## 2. Unit Batteries

- a. Every week the specific gravity, the voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.
- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 Volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
- c. The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outage. In lieu of the performance test every third refueling outage, any battery that shows "signs of degradation or has reached 85% of its service life" shall be subjected to an annual performance test. The service test need not be performed on the refueling outage during which the performance test was conducted. The specific gravity and voltage of each cell shall be determined after the discharge and logged.

## 3. Swing Buses

- a. Every two months the swing buses supplying power to the Low Pressure Coolant Injection System (LPCIS) valves shall be tested to assure that the transfer circuits operate as designed.

## 3.9.B (Cont'd)

6. From and after the date that the fuel oil in one of the diesel generator main storage tanks does not conform with specification 4.9.A.1.f, either:
  1. Declare the associated diesel generator inoperable, or
  2. Implement the following actions:
    - a. Isolate the main storage tank from the system, with the associated diesel generator being supplied from one of the remaining storage tanks within 8 hours, and
    - b. Establish and maintain a minimum of 104,000 gallons of diesel fuel oil in the other three main storage tanks within 24 hours, and
    - c. Sample the fuel oil in the other three main storage tanks and confirm conformance with specification 4.9.A.1.f within 24 hours, and
    - d. Replace the unacceptable fuel oil with acceptable fuel oil and return the storage tank to service within 7 days, or place the reactor in Cold Shutdown within 24 hours. Accelerated testing of the diesel generators and ECCS as specified in 4.5.F.1 is not required.

### 3.9 BASES (Cont'd.)

The 125-Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250-Volt portion of the 125/250-Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

The ESWS has two 100 per cent cooling capacity pumps, each powered from a separate standby power supply. A third pump equivalent to the two ESW pumps, the Emergency Cooling Water pump, is located at the Emergency Cooling Tower. This latter pump requires the operability of one of the two ESW booster pumps and two of the three Emergency Cooling Tower fans to function adequately. In the event 2 pumps are inoperable, the allowable repair period is conservative in view of the 3-month test interval for the system.

### 4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 75% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for one to two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Each diesel generator has one air compressor and two air receivers for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel generator, one receiver in each set of receivers will be drawn down below the point at which the corresponding compressor automatically starts to check operation and the ability of the compressors to recharge the receivers.

The diesel generator fuel consumption rate at full load is approximately 200 gallons per hour. Thus, the monthly load test of the diesel generators will test the operation and the ability of the fuel oil transfer pumps to refill the day tank and will check the operation of these pumps from the emergency source.

The test of the diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel generator starting and closure of diesel generator breaker and sequencing of load on the diesel generator. The diesel generator will be started by simulation of a loss-of-coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power. The timing sequence will be checked to assure that the diesel generators can operate the LPCI pumps at rated speed within 18 seconds, and the core spray pumps at rated speed within twenty-four seconds.

## 4.9 BASES (Cont'd.)

Periodic tests between refueling outages verify the ability of the diesel generator to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components, plus a functional test one-a-cycle, is sufficient to maintain adequate reliability.

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outages. This testing frequency complies with the testing requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450 (1975), "Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries," and Regulatory Guide 1.129, Revision 1 (February 1978), "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

A performance test determines the ability of the battery to meet a specified discharge rate and duration based on the manufacturer's rating. A service test proves the capability of the battery to deliver the design requirements of the dc systems; i.e., supply and maintain in operable status all of the actual emergency loads for the design basis accident. A performance test is the most severe test because the cycling on the battery at manufacturer's rating shortens the service life of the battery. A service test is performed at design load instead of manufacturer's ratings.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine. Amendment No. 131 centralized commitments related to Position C.2 of Regulatory Guide 1.137, Revision 1 (October, 1979) "Fuel Oil Systems for Standby Diesel Generators".

When it is determined that some auxiliary electrical equipment is out-of-service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.

The test interval for the Emergency Service Water System, plus the ESW booster pumps, Emergency Cooling Tower fans, and pump room fans associated with the ESW pumps is deemed adequate to provide assurance that the equipment will be operable based on good engineering judgment and system redundancy, plus the additional testing accomplished when the diesel generators are tested. Pump flow tests during normal operation will be performed by measuring the shut-off head.



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. 134  
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 October 1, 1981 as supplemented and amended on November 15, 1984, November 24, 1986, September 2 and November 18, 1987, and March 30, 1988, 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:

May 31, 1988

- 2 -

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 134, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective six months from the date of issuance to accommodate revisions to plant procedures and test equipment requirements.

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: May 31, 1988

PDI-2/D  
MO/Butler  
5/1/88

PDI-2/RM  
REMartin:mr  
4/28/88

OGC  
5/2/88

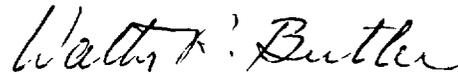
PDI-2/D  
WButler  
5/29/88 WB

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 134, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective six months from the date of issuance to accommodate revisions to plant procedures and test equipment requirements.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 31, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 134

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. Asterisk pages are maintained to provide document completeness.

<u>Remove</u>	<u>Insert</u>
217	217*
218	218
218a	218a
-	218b
-	218c
-	220a
223	223*
224	224

LIMITING CONDITIONS FOR OPERATION3.9 AUXILIARY ELECTRICAL SYSTEMApplicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification:A. Auxiliary Electrical Equipment

The reactor shall not be made critical unless all of the following conditions are satisfied:

1. Both off-site sources and the startup transformers and emergency transformers are available and capable of automatically supplying power to the 4kV emergency buses.
2. The four diesel generators shall be operable and there shall be a minimum of 104,000 gal. of diesel fuel on site.
3. The 4kV emergency buses and the 480V emergency load centers are energized.
4. The four unit 125V batteries and their chargers shall be operable.

SURVEILLANCE REQUIREMENTS4.9 AUXILIARY ELECTRICAL SYSTEMApplicability:

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:A. Auxiliary Electrical Equipment

## 1. Diesel Generators

- a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue for at least a one hour period at rated load.

During the monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall be demonstrated, and the diesel starting time to reach rated voltage and frequency shall be logged.

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

- b. Once per operating cycle the condition under which the diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The results shall be logged.
- c. Once a month the quantity of diesel fuel available shall be logged.
- d. Accumulated water shall be removed:
  - 1) From the day tanks at least once every 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
  - 2) From the main storage tanks at least once every 31 days.

If it is suspected that water has entered the suction piping from the day tank, the entire fuel oil system between the day tank and the injectors shall be flushed.

- e. New fuel oil shall be sampled in accordance with ASTM D4057-81 prior to addition to the main storage tanks and:
  - 1) In accordance with the tests specified in ASTM D975-81 prior to addition to the main storage tanks, it shall be verified that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60 degrees F or a specific gravity of within 0.0016 at 60/60 degrees F, when compared to the supplier's certificate; or an absolute specific

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

gravity at 60/60 degrees F of greater than or equal to 0.83 but less than or equal to 0.89; or an API gravity at 60 degrees F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

b) A kinematic viscosity at 40 degrees C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.

c) A flash point equal to or greater than 125 degrees F, and

d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.

2) Within 31 days of obtaining the sample, it shall be verified that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

f. At least once every 31 days a sample of fuel oil shall be obtained from the main storage tanks in accordance with ASTM D2276-78, and it shall be verified that total particulate

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-79, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.

- g. Each fuel oil storage tank shall be drained, accumulated sediment removed, and the tanks cleaned using a sodium hypochlorite or equivalent solution, at least once every ten years.
- h. The fuel oil storage tank cathodic protection system shall be checked as follows:
  - 1) At least once every twelve months perform a test to determine whether the cathodic protection is adequate, and
  - 2) At least once every two months inspect the cathodic protection rectifiers.

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A4.9.A (Cont'd)

- j. Each diesel generator shall be given an annual inspection in accordance with instructions based on the manufacturer's recommendations.

## 2. Unit Batteries

- a. Every week the specific gravity, the voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.
- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 Volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
- c. The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outage. In lieu of the performance test every third refueling outage, any battery that shows "signs of degradation or has reached 85% of its service life" shall be subjected to an annual performance test. The service test need not be performed on the refueling outage during which the performance test was conducted. The specific gravity and voltage of each cell shall be determined after the discharge and logged.

## 3. Swing Buses

- a. Every two months the swing buses supplying power to the Low Pressure Coolant Injection System (LPCIS) valves shall be tested to assure that the transfer circuits operate as designed.

## 3.9.B (Cont'd)

6. From and after the date that the fuel oil in one of the diesel generator main storage tanks does not conform with specification 4.9.A.1.f, either:
  1. Declare the associated diesel generator inoperable, or
  2. Implement the following actions:
    - a. Isolate the main storage tank from the system, with the associated diesel generator being supplied from one of the remaining storage tanks within 8 hours, and
    - b. Establish and maintain a minimum of 104,000 gallons of diesel fuel oil in the other three main storage tanks within 24 hours, and
    - c. Sample the fuel oil in the other three main storage tanks and confirm conformance with specification 4.9.A.1.f within 24 hours, and
    - d. Replace the unacceptable fuel oil with acceptable fuel oil and return the storage tank to service within 7 days, or place the reactor in Cold Shutdown within 24 hours. Accelerated testing of the diesel generators and ECCS as specified in 4.5.F.1 is not required.

3.9 BASES (Cont'd.)

The 125-Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250-Volt portion of the 125/250-Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

The ESWS has two 100 per cent cooling capacity pumps, each powered from a separate standby power supply. A third pump equivalent to the two ESW pumps, the Emergency Cooling Water pump, is located at the Emergency Cooling Tower. This latter pump requires the operability of one of the two ESW booster pumps and two of the three Emergency Cooling Tower fans to function adequately. In the event 2 pumps are inoperable, the allowable repair period is conservative in view of the 3-month test interval for the system.

4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 75% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for one to two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Each diesel generator has one air compressor and two air receivers for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel generator, one receiver in each set of receivers will be drawn down below the point at which the corresponding compressor automatically starts to check operation and the ability of the compressors to recharge the receivers.

The diesel generator fuel consumption rate at full load is approximately 200 gallons per hour. Thus, the monthly load test of the diesel generators will test the operation and the ability of the fuel oil transfer pumps to refill the day tank and will check the operation of these pumps from the emergency source.

The test of the diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel generator starting and closure of diesel generator breaker and sequencing of load on the diesel generator. The diesel generator will be started by simulation of a loss-of-coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power. The timing sequence will be checked to assure that the diesel generators can operate the LPCI pumps at rated speed within 18 seconds, and the core spray pumps at rated speed within twenty-four seconds.

## 4.9 BASES (Cont'd.)

Periodic tests between refueling outages verify the ability of the diesel generator to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components, plus a functional test one-a-cycle, is sufficient to maintain adequate reliability.

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outages. This testing frequency complies with the testing requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450 (1975), "Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries," and Regulatory Guide 1.129, Revision 1 (February 1978), "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

A performance test determines the ability of the battery to meet a specified discharge rate and duration based on the manufacturer's rating. A service test proves the capability of the battery to deliver the design requirements of the dc systems; i.e., supply and maintain in operable status all of the actual emergency loads for the design basis accident. A performance test is the most severe test because the cycling on the battery at manufacturer's rating shortens the service life of the battery. A service test is performed at design load instead of manufacturer's ratings.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine. Amendment No. 134 centralized commitments related to Position C.2 of Regulatory Guide 1.137, Revision 1 (October, 1979) "Fuel Oil Systems for Standby Diesel Generators".

When it is determined that some auxiliary electrical equipment is out-of-service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.

The test interval for the Emergency Service Water System, plus the ESW booster pumps, Emergency Cooling Tower fans, and pump room fans associated with the ESW pumps is deemed adequate to provide assurance that the equipment will be operable based on good engineering judgment and system redundancy, plus the additional testing accomplished when the diesel generators are tested. Pump flow tests during normal operation will be performed by measuring the shut-off head.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENT NOS. 131 AND 134 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 October 1, 1981 as supplemented and amended on November 15, 1984, November 24, 1986, September 2 and November 18, 1987, and March 30, 1988, Philadelphia Electric Company requested an amendment to Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station, Unit Nos. 2 and 3. The amendments would change the Plant Technical Specifications (TS) 4.9.A and 3.9.B relating to diesel generator (DG) fuel oil system in response to guidance of Regulatory Guide (RG) 1.137, "Fuel Oil Systems for Standby Diesel Generators" issued in October 1979. The above guide identifies the quality criteria for DG fuel oil properties (e.g., specific or API gravity, viscosity, water and sediment), the sampling and testing requirements to assure the quality, and the required actions when the fuel oil does not meet the quality criteria. Based on its review of the 1981 submittal, the staff requested the licensee to revise the proposed TS changes indicating that they did not satisfy the requirements of RG 1.137. In response to the above request, the licensee provided submittals dated November 24, 1986, September 2 and November 18, 1987, and March 30, 1988.

In the above submittals, the licensee claimed that the newly proposed TS changes comply with the guidance on DG fuel oil systems in RG 1.137, except in one area (i.e., corrective action). For the exception, the licensee proposed an alternative approach and provided justification for the same. The staff's evaluation of the proposed TS changes for the DG fuel oil system for Peach Bottom Units 2 and 3 based on the licensee's updated submittals dated September 2 and November 18, 1987 and March 30, 1988 is provided below.

2.0 EVALUATION

The DG fuel oil system which supplies quality fuel oil to the DGs is one of the support systems for the DGs required to ensure their proper

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operation. Plant TS relating to the system spell out the quality criteria for the fuel oil, the sampling and testing requirements to ensure the quality, and additionally, the corrective actions in the event the fuel does not meet the specified quality criteria. Peach Bottom Units 2 & 3 have four DGs, each with its own main fuel storage tank, fuel oil transfer pump and day tank. Though normally each DG utilizes its own fuel oil storage tank, fuel transfer pump and fuel oil day tank to receive its fuel supply, the plant design also includes cross tie provisions to fill each fuel oil day tank from any one of the fuel storage tanks using any one of the fuel transfer pumps. This operational flexibility is included in the design to ensure the maximum availability of the DGs, in the event the fuel oil in any storage tank gets contaminated or any transfer pump fails.

The proposed TS requires removal of accumulated water once every 31 days from the main storage tanks and the day tanks and additionally from the day tank when its associated DG has been operated for more than one hour. Further, it requires flushing of the entire fuel oil system between the day tank and the injectors whenever it is suspected that water has entered the suction piping from the day tank. Regarding new fuel oil, the proposed TS spells out (1) the specifications for its properties (e.g., API gravity or specific gravity, kinematic viscosity, flash point, appearance and color) that have to be verified by sampling and testing, (2) the applicable ASTM documents in accordance with which the sampling and testing have to be conducted, and (3) the frequency for sampling (prior to its addition to the main storage tanks) and testing (either prior to its addition to the main storage tanks or within 31 days of obtaining the oil sample, as appropriate). Regarding the existing fuel oil, the proposed TS identifies (1) the condition (total particulate contamination level) to be verified, (2) the ASTM document (ASTM D2276-78) in accordance with which the sampling and testing have to be conducted, and (3) the frequency for sampling and testing (once every 31 days). Specifically, the TS requires verifying that the total particulate contamination in the existing fuel oil in the storage tank is less than 10 mg/liter, when it is tested in accordance with ASTM D2276-78, Method A. The sampling and testing procedures for the new and existing fuel oil identified in the licensee's proposed TS are the same as those that have been previously approved (for example, on the McGuire plant in 1984) by the staff, except in one area. The exception pertains to the licensee's specified pore size of up to 3 microns (instead of 0.8 microns as specified in ASTM D2276-78) for the filter used for testing the existing fuel oil particulate contamination level. The licensee justified the above specification, stating that the diesel vendor had confirmed its acceptability for conducting the test, since the in-line filters on the diesels are not designed to trap particulates less than 3 microns in size, as passage of such particulates through the fuel injectors has not been known to cause any degradation of the engine performance. The proposed TS also includes other surveillance requirements (i.e., draining, removing accumulated sediment and cleaning each fuel oil storage tank once every 10 years; checking the storage tank cathodic protection system periodically) which are the same as those

specified in RG 1.137. Based on the above considerations, the staff finds the licensee's proposed TS changes relating to sampling and testing of the DG fuel oil (both new and existing) comply with the intent and purpose of RG 1.137, in this regard.

Regarding corrective actions when the total particulate contamination is equal to or exceeds the limit of 10 mg/liter, the licensee proposed a T.S. 3.9.B with two features: either declare the associated DG inoperable as recommended by RG 1.137 or implement the following actions (alternative approach in the November 18, 1987 submittal):

1. Isolate the contaminated storage tank from the DG fuel oil system and supply the associated DG, fuel oil from one of the remaining storage tanks within 8 hours, and
2. Establish and maintain the specified minimum of 104,000 gallons of DG fuel oil in the other three main storage tanks within 24 hours, and
3. Sample the fuel oil in the other three main storage tanks and confirm compliance with the specified particulate contamination level (less than 10 mg/liters) within 24 hours, and
4. Replace the unacceptable fuel oil with acceptable fuel oil in the affected storage tank and return it to service within 7 days or place the reactors in cold shutdown within 24 hours.

The licensee stated that the alternative approach will not compromise the currently existing electrical independence among the 4 DGs for the following reasons:

1. The fuel oil transfer pump dedicated to the affected DG will still be used to transfer oil to the associated day tank, since the cross ties between the day tanks and the storage tanks are located upstream of the transfer pumps, and
2. There are no electrical components upstream of the transfer pumps which could be intertied to compromise electrical independence.

The licensee has also committed, in the November 18, 1987 submittal, to verify, prior to the implementation of the proposed alternative approach, (1) the availability of adequate NPSH in the storage tank for two fuel oil transfer pumps, and (2) by testing, the capability of the system to handle increased flow through the common piping segment. In this context, the staff notes, as supported in the licensee's March 30, 1988 submittal, that the DG fuel oil system is safety-related, Q-listed and seismic Category I, and the piping is in accordance with ANSI B31.1. Based on the above considerations, the staff has determined that there is reasonable assurance that common mode failure due to cross tie rendering two DGs inoperable will not occur, particularly, when it is realized that

the cross tie provision will be utilized only during a short time (7 days). The staff further notes that the alternative approach does not require accelerated surveillance testing of the remaining DGs and the ECCS (i.e., all low pressure core cooling and containment cooling subsystems) for demonstrating their operabilities. Current TS require such additional tests with one DG declared inoperable. This meets the intent of Generic Letter 84-15, "Proposed staff actions to improve and maintain diesel generator reliability," which recommends reduction of extraneous DG surveillance testing for improving and maintaining DG reliability. The staff also notes that both the approaches permit continued plant operation with only 3 DG fuel oil storage tanks up to 7 days provided the specified applicable actions (in the existing TS for a DG which is declared inoperable; in the proposed TS for the alternative approach) are implemented. Based on all the considerations discussed above, the staff finds the licensee's proposed TS changes relating to corrective actions meet the intent of RG 1.137 in this regard (i.e., supply acceptable quality fuel oil to the DGs; replacement of contaminated fuel oil, in the affected storage tank by acceptable fuel oil within a week).

The staff has also reviewed the licensee's proposed change to the associated basis section and finds it acceptable.

Based on the above findings the staff concludes that the licensee's proposed TS changes for the DG fuel oil system for Peach Bottom Units 2 and 3 comply with the intent and purpose of RG 1.137 and are, therefore, acceptable.

### 3.0 ENVIRONMENTAL CONSIDERATIONS

These amendments involve a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to 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 nor environmental assessment need be prepared in connection with the issuance of the amendments.

### 4.0 CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (53 FR 3957) on February 10, 1988 and consulted with the State of Pennsylvania. No public comments were received and the State of Pennsylvania did not have any comments.

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: T. Chandrasekaran

Dated: May 31, 1988