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Dockets Nos. 50-277
and 50-278

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

Dear Mr. Bauer:

SUBJECT: TECHNICAL SPECIFICATION AMENDMENTS PERTAINING TO THE
MONITORING OF ELECTRIC POWER TO THE REACTOR PROTECTION SYSTEM

The Commission has issued the enclosed Amendments Nos. 99 and 101, to Facility Operating Licenses Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Units Nos. 2 and 3. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated December 23, 1981, as supplemented by letters dated March 30, 1983, June 2, 1983, and September 29, 1983.

The changes to the TSs add trip setpoints, a limiting condition for operation and surveillance requirements for design modifications to the Peach Bottom Reactor Protection System (RPS).

In addition, we have reviewed your proposed design modifications to protect the RPS from abnormal voltage and frequency conditions and have concluded that the proposed design modifications together with the Technical Specifications permitted by these amendments will provide the required protection to the RPS. Therefore, this completes our review of this action for the Peach Bottom facility.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next monthly Federal Register notice.

Sincerely,

"ORIGINAL SIGNED BY:"

Gerald E. Gears, Project Manager
Operating Reactors Branch #4
Division of Licensing

Enclosures:

1. Amendment No. 99 to DPR-44
2. Amendment No.101 to DPR-56
3. Safety Evaluation

ORB#4:DL
RIngram
6/5 3/8/84

ORB#4:DL
GGears;cf
3/10/84

ORB#4:DL
JSto1z
3/10/84

AD-OR:DL
GLainas
3/10/84

OELD
J. GRAY
6/7/12/84

Philadelphia Electric Company

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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. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 99
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 December 23, 1981, as supplemented by letters dated March 30, 1983, June 2, 1983, and September 29, 1983, 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 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 license amendment will not be inimical to the common defense and security or to the health and 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:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 99, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION


George W. Rivenbark, Acting Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 21, 1984

ATTACHMENT TO LICENSE AMENDMENT NO.99

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace the following page and add the new page of the Appendix "A" Technical Specifications with the enclosed pages. The pages are identified by Amendment number and contain a vertical line indicating the area of change.

Remove

36

Insert

36

36a

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

D. Reactor Protection System Power Supply

1**Reactor Protection System Power Supply:

One trip train* per RPS MG set may be in the bypassed or inoperative condition for a period of 72 hours. If this condition cannot be satisfied, or if both trip trains are inoperative, the RPS bus shall be transferred to the alternate source or de-energized within 30 minutes.

C. When it is determined that a channel has failed in the unsafe condition, the other RPS channels that monitor the same variable shall be functionally tested immediately before the trip system containing the failure is tripped. The trip system containing the unsafe failure may be placed in the untripped condition during the period in which surveillance testing is being performed on the other RPS channels. The trip system may be in the untripped position for no more than eight hours per functional trip period for this testing.

D. Reactor Protection System Power Supply

1 **The following RPS power supply (MG set) protective devices shall be functionally tested at least once every six months and calibrated once each refueling outage.

<u>Device</u>	<u>Acceptable Setting</u>
Undervoltage	113 + 2 Volts
Overvoltage	131 + 2 Volts
Underfrequency	57 Hz + .2 Hz
Underfrequency	57 Hz + .2 Hz
Time Delay	6 sec + 1 sec

PBAPS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

2** One trip train* of the RPS alternate power supply may be in the bypassed or inoperative condition for a period of 72 hours. If this condition cannot be satisfied, or if both trip trains are inoperative, the RPS bus shall be transferred to the RPS MG set or de-energized within 30 minutes.

2** The following RPS alternate power supply protective devices shall be functionally tested at least once every six months and calibrated once each refueling outage.

<u>Device</u>	<u>Acceptable Setting</u>
Undervoltage	113 + 2 Volts
Overvoltage	131 + 2 Volts
Underfrequency	57 Hz + .2 Hz

* A trip train consists of one breaker, one undervoltage relay, one overvoltage relay, one underfrequency relay, one time delay relay (MG set only), and the associated logic.

** Effective upon installation of the protective trip devices.



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. 101
License No. DPR-56

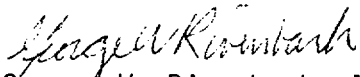
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Philadelphia Electric Company, et al. (the licensee) dated December 23, 1981, as supplemented by letters dated March 30, 1983, June 2, 1983, and September 29, 1983, complies with the standards 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 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 license amendment will not be inimical to the common defense and security or to the health and 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:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.101, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION


George W. Rivenbark, Acting Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 21, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 101

FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

Replace the following page and add the new page of the Appendix "A" Technical Specifications with the enclosed pages. The pages are identified by Amendment number and contain a vertical line indicating the area of change.

Remove

36

Insert

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36a

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

D. Reactor Protection System
Power Supply

1**Reactor Protection System
Power Supply:

One trip train* per RPS MG set may be in the bypassed or inoperative condition for a period of 72 hours. If this condition cannot be satisfied, or if both trip trains are inoperative, the RPS bus shall be transferred to the alternate source or de-energized within 30 minutes.

C. When it is determined that a channel has failed in the unsafe condition, the other RPS channels that monitor the same variable shall be functionally tested immediately before the trip system containing the failure is tripped. The trip system containing the unsafe failure may be placed in the untripped condition during the period in which surveillance testing is being performed on the other RPS channels. The trip system may be in the untripped position for no more than eight hours per functional trip period for this testing.

D. Reactor Protection System
Power Supply

1.**The following RPS power supply (MG set) protective devices shall be functionally tested at least once every six months and calibrated once each refueling outage.

<u>Device</u>	<u>Acceptable Setting</u>
Undervoltage	113 + 2 Volts
Overvoltage	131 + 2 Volts
Underfrequency	57 Hz + .2 Hz
Underfrequency	57 Hz + .2 Hz
Time Delay	6 sec + 1 sec

PBAPS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

2** One trip train* of the RPS alternate power supply may be in the bypassed or inoperative condition for a period of 72 hours. If this condition cannot be satisfied, or if both trip trains are inoperative, the RPS bus shall be transferred to the RPS MG set or de-energized within 30 minutes.

2** The following RPS alternate power supply protective devices shall be functionally tested at least once every six months and calibrated once each refueling outage.

<u>Device</u>	<u>Acceptable Setting</u>
Undervoltage	113 + 2 Volts
Overvoltage	131 + 2 Volts
Underfrequency	57 Hz + .2 Hz

* A trip train consists of one breaker, one undervoltage relay, one overvoltage relay, one underfrequency relay, one time delay relay (MG set only), and the associated logic.

** Effective upon installation of the protective trip devices.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENTS NOS. 99 AND 101 TO FACILITY OPERATING LICENSES 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, UNITS NOS. 2 AND 3

DOCKETS NOS. 50-277 AND 50-278

Introduction and Summary

Our concerns regarding the deficiencies in the existing design of Reactor Protection System (RPS) power monitoring in BWRs was transmitted to Philadelphia Electric Company (the licensee) by NRC generic letter dated September 24, 1980. In response to this, by letters dated November 26, 1980, March 9, 1981, December 23, 1981, November 8, 1982, March 30, 1983, June 2, 1983 and September 29, 1983, the licensee proposed design modifications and changes to the Technical Specifications. A detailed review and technical evaluation of these proposed modifications and changes to the Technical Specifications were performed by Lawrence Livermore Laboratory (LLL) under contract to the NRC, and with general supervision by NRC staff. This work is reported in LLL report UCID-19720, "Technical Evaluation Report on the Monitoring of Electric Power to the Reactor Protection System," dated September 1983 (attached). We have reviewed this Technical Evaluation Report and concur in its conclusion that the proposed design modifications and Technical Specification changes are acceptable.

Proposed Changes and Evaluation Criteria

The following design modifications and Technical Specification changes were proposed by the licensee for Peach Bottom Atomic Power Station, Units 2 and 3:

1. Installation of two Class 1E detection and isolation assemblies, similar to the General Electric (GE) designed protection assemblies, in each of the three sources of power to the RPS (RPS M-G sets A and B and the one alternate source). Each assembly includes a circuit breaker and a monitoring module consisting of an undervoltage, an overvoltage and an underfrequency sensing relay. In conjunction with the underfrequency relay, there is an auxiliary relay to provide the proposed time delay for an underfrequency trip.
2. The licensee also proposed the addition of trip setpoints, limiting condition for operation and surveillance requirements in the Technical Specifications associated with the design modifications cited above.

By letter dated September 29, 1983, the licensee, as a result of discussions with the NRC staff, proposed changes to its December 23, 1981, application for amendment concerning surveillance setpoints for the RPS system. These changes were in direct response to the staff's concerns expressed in previous telephone conversations and result in maintaining the RPS equipment voltages within design limits. We have reviewed these changes and find that they do not affect the substance of the licensee's December 23, 1981, amendment request.

The criteria used by LLL in its technical evaluation of the proposed changes include GDC-2, "Design Bases for Protection Against Natural Phenomena," and GDC-21, "Protection System Reliability and Testability," of Appendix A to 10 CFR 50; IEEE-279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations;" and NRC memorandum from F. Rosa to J. Stolz, T. Ippolito and G. Lainas dated February 19, 1979.

We have reviewed the LLL Technical Evaluation Report which includes the proposed surveillance setpoints documented in the licensee's letter of September 29, 1983, and concur in its findings that (1) the proposed modifications will provide automatic protection to the RPS components from sustained abnormal power supply and (2) the proposed changes to the Technical Specifications include acceptable limiting conditions for operation and periodic testing in accordance with the Standard Technical Specifications for BWRs. Therefore, we conclude that the licensee's proposed design modifications and changes to Technical Specifications are acceptable.

Environmental Considerations

The amendments involve a change in the installation or use of a facility component located within the restricted area. We have determined that the amendments involve no significant increase in the amounts of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupation 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.

Conclusion

We have 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: June 21, 1984

The following NRC personnel have contributed to this Safety Evaluation:
I. Ahmed.

UCID- 19720

TECHNICAL EVALUATION REPORT ON THE
MONITORING OF ELECTRIC POWER
TO THE REACTOR PROTECTION SYSTEM
FOR THE
PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 AND 3

(Docket Nos. 50-277, 50-278)

James C. Selan

September 23, 1983



This is an informal report intended primarily for internal or limited external distribution. The opinions and conclusions stated are those of the author and may or may not be those of the Laboratory.

This work was supported by the United States Nuclear Regulatory Commission under a Memorandum of Understanding with the United States Department of Energy.

NRC FIN No. A-0250

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ABSTRACT

This report documents the technical evaluation of the monitoring of electric power to the reactor protection system (RPS) at the Peach Bottom Atomic Power Station, Units 2 and 3. The evaluation is to determine if the proposed design modification will protect the RPS from abnormal voltage and frequency conditions which could be supplied from the power supplies and will meet certain requirements set forth by the Nuclear Regulatory Commission.

The proposed design modifications and Technical Specification changes will provide the required protection for the RPS components from sustained abnormal power.

FOREWORD

This report is supplied as part of the Selected Operating Reactor Issues Program II being conducted for the U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Licensing, by Lawrence Livermore National Laboratory.

The U. S. Nuclear Regulatory Commission funded the work under the authorization entitled "Selected Operating Reactor Issues Program II," B&R B&R 20 19 10 11 1, FIN No. A0250.

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TECHNICAL EVALUATION REPORT ON THE
MONITORING OF ELECTRIC POWER
TO THE REACTOR PROTECTION SYSTEM
AT THE PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 AND 3

(Docket No. 50-277, 50-278)

James C. Selan

Lawrence Livermore National Laboratory, Nevada

1. INTRODUCTION

During the operating license review for Hatch 2, the Nuclear Regulatory Commission (NRC) staff raised a concern about the capability of the Class 1E reactor protection system (RPS) to operate after suffering sustained, abnormal voltage or frequency conditions from a non-Class 1E power supply. Abnormal voltage or frequency conditions could be produced as a result of one of the following causes: combinations of undetected, random single failures of the power supply components, or multiple failures of the power supply components caused by external phenomena such as a seismic event.

The concern for the RPS power supply integrity is generic to all General Electric (GE) boiling water reactors (BWR) MARK 3's, MARK 4's, and MARK 5's and all BWR MARK 6's that have not elected to use the solid state RPS design. The staff therefore pursued a generic resolution. Accordingly, GE proposed a revised design, in conceptual form, for resolution of this concern [Ref. 1]. The proposed modification consists of the addition of two Class 1E "protective packages" in series between each RPS motor-generator (M-G) set and its respective RPS bus, and the addition of two similar packages in series in the alternate power source circuit to the RPS buses. Each protective package would include a breaker and associated overvoltage, undervoltage and underfrequency relaying. Each protective package would meet the testability requirements for Class 1E equipment.

With the protective packages installed, any abnormal output type failure (undetectable random or seismically caused) in either of the two RPS M-G sets (or the alternate supply) would result in a trip of either one or both of the two Class 1E protective packages. This tripping would interrupt the power to the effected RPS channel; thus producing a scram signal on that channel, while retaining full scram capability by means of the other channel. Thus, fully redundant Class 1E protection is provided, bringing the overall

RPS design into full conformance with General Design Criteria (GDC)-2 [Ref. 2], and GDC-21 [Ref. 3] (including IEEE-279 [Ref. 4] and the standard review plan [Ref. 5]). The NRC staff reviewed the proposed GE design and concluded that the modification was acceptable [Ref. 6], and should be implemented in conformance with the applicable criteria for Class 1E systems.

The NRC requires that the components of the RPS not be exposed to unacceptable electric power of any sustained abnormal quality that could damage the RPS. This involves providing means to detect any overvoltage, undervoltage, or underfrequency condition that is outside the design limits of the RPS equipment and to disconnect the RPS from such abnormal electric power before damage to the RPS can occur. The equipment which performs these functions must satisfy the single failure criterion and be seismically qualified. The NRC issued a generic letter [Ref. 7] to all operating BWR's requesting the licensees to submit design modification details and Technical Specifications for post implementation review.

By letters dated November 26, 1980 [Ref. 8], March 9, 1981 [Ref. 9], October 30, 1981 [Ref. 10], December 23, 1981 [Ref. 11], May 21, 1982 [Ref. 12], November 8, 1982 [Ref. 13], March 30, 1983 [Ref. 14], June 2, 1983 [Ref. 15], and a telephone conference on September 12, 1983 [Ref. 16], Philadelphia Electric Company, the licensee, submitted design modification details and Technical Specifications changes regarding the monitoring of electrical power to the RPS at the Peach Bottom Atomic Power Station, Units 2 and 3.

The purpose of this report is to evaluate the licensee's submittal with respect to the NRC criteria and present the reviewer's conclusion on the adequacy of the design modifications to protect the RPS from abnormal voltage and frequency conditions.

2. DESIGN DESCRIPTION

The licensee has proposed to install two Class 1E detection and isolating packages (similar to the approved GE conceptual design) to monitor the electric power in each of the three sources of power (two M-G sets and an alternate source per each unit) to the RPS. Each package is identical and consists of a circuit breaker, undervoltage relay (ITE 27), overvoltage relay (ITE 59), underfrequency relay (SFF 31), and a time-delay relay (ETR). The time-delay relay is used only in conjunction with the underfrequency relay. The control power for the time delay relay is 125 Vdc. When abnormal electric power is detected by either package, the respective circuit breaker will trip and disconnect the RPS from the abnormal power source.

The monitoring packages associated with the MG sets will detect overvoltage and undervoltage conditions and provide an instantaneous trip when the voltage setpoints are exceeded, while providing a time-delayed trip upon detection of an underfrequency condition when the frequency setpoint is exceeded. The monitoring packages associated with the alternate sources provide an instantaneous trip when the overvoltage, undervoltage and underfrequency setpoints are exceeded.

3. EVALUATION

The NRC stated several requirements that the licensee must meet in their design modification to monitor the power to the RPS. A statement of these requirements followed by an evaluation of the licensee's submittals are as follows:

- (1) "The components of the RPS shall not be exposed to unacceptable electric power of any sustained abnormal quality that could damage the RPS."

Each monitoring package will detect overvoltage, undervoltage, and underfrequency conditions with the following setpoints.

*Nominal voltage 120 volts, 60 Hz nominal

Condition	Setpoint	Time Delay
Overvoltage	131 \pm 2 volts	Instantaneously for MG sets and alternate sources
Undervoltage	113 \pm 2 volts	Instantaneously for MG sets and alternate sources
Underfrequency	57 \pm 0.2 Hz	6 \pm 1 seconds for MG sets Instantaneously for alternate sources

*Voltage measurements indicated a 6.5 to 7.5 volt drop in voltage from the MG set output to the scram solenoid valve fuse panels. The MG set output will be adjusted to maintain 115 \pm 2 volts at the hydraulic control units [Refs. 14 and 16].

GE certified RPS component (relays and contactors) operating capability is \pm 10% of 115 volts and - 5% of 60 Hz on its terminal, resulting in a voltage range of 126.5 to 103.5 volts and a frequency range of 60 to 57 Hz [Ref. 17]. For the above proposed setpoints and measured voltage drops, a minimum RPS component terminal voltage of 103.5 volts and a maximum terminal voltage of 127 volts could occur at which time the protective relaying will trip instantaneously.

The 6-second time delay associated with the 57 Hz underfrequency setpoint is greater than the time delay recommended or accepted by GE. Tests results on MG set coast-down showed that the

lowest frequency of 54.4 Hz was reached in a maximum of 11 seconds [Ref. 13]. Based on this, the licensee performed time/underfrequency tests on an HFA relay, scram contactor, and a scram solenoid valve to determine the effects on component coil temperature rise as a result of sustained underfrequency. These tests were conducted by gradually decreasing the frequency to 53 Hz during 11-second and 15-second intervals. A total of 20 tests per component (10 for the 11-second interval and 10 for the 15-second interval) was made.

For the proposed underfrequency setpoint, the minimum terminal frequency of 56.8 Hz for a maximum of 7 seconds would result before protective relay tripping occurs. The tests indicated for a 110 °F ambient temperature (maximum temperature of 105 °F expected in the operating environment) and decreasing frequency to 53 Hz during an 11-second and 15-second interval, less than a 0.2 °F rise in coil temperature resulted. Since high coil temperature is the most significant contributing factor affecting component operation, these tests demonstrated that the resulting small rise in the coil temperature did not degrade component performance nor effect the pickup and dropout capability of the components.

Based on the above maximum measured voltage drops and the results of the time/underfrequency tests, the proposed trip setpoints and time delays will provide RPS component protection from sustained abnormal power.

- (2) "Disconnecting the RPS from the abnormal power source shall be automatic."

The monitoring module will automatically disconnect the RPS buses from the abnormal power supply after the set time delay should the parameters setpoints be exceeded.

- (3) "The power monitoring system shall meet the requirements of IEEE 279-1971, GDC-2 and GDC-21."

The monitoring packages meet the Class 1E requirements of IEEE 279, the single failure criteria of GDC-21, and the seismic qualifications of GDC-2.

- (4) "Technical Specifications shall include limiting conditions for operation, surveillance requirements, and trip setpoints."

In accordance with the Standard Technical Specifications, the licensee submitted [Refs. 11, 14, 15, and 16] Technical Specification changes which included limiting conditions for operation when the number of operable monitoring systems is less than required and surveillance requirements which included a functional test, channel calibration, and verification of the trip setpoints.

4. CONCLUSION

Based on the information submitted by Philadelphia Electric Company for the Peach Bottom Atomic Power Station, Units 2 and 3, it is concluded that:

- (1) The proposed setpoints of the relays in the two protective packages to be installed in series, in each of the power sources to the RPS buses, will automatically protect the RPS components from sustained abnormal overvoltage, undervoltage, and underfrequency conditions outside the design limits of the RPS components.
- (2) The protective packages meet the requirements of Class 1E equipment (IEEE 279), single failure criteria (GDC-21), and seismic qualification (GDC-2).
- (3) The proposed time delay before circuit breaker tripping will not result in damage to components of the RPS or prevent the RPS from performing its safety functions.
- (4) The following minimum and maximum limits to the trip setpoints, limiting conditions for operation (LCO), and surveillance requirements, as proposed by the licensee in accordance with the Standard Technical Specifications, will protect the RPS components from sustained abnormal power:
 - (a) Overvoltage \leq 133 volts Instantaneously
Undervoltage \geq 111 volts Instantaneously
Underfrequency \geq 56.8 Hz Time delay \leq 7 seconds for MG sets

Instantaneously for alternate sources
 - (b) With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable channel to operable status within 72 hours or remove the associated RPS MG set or alternate power supply from service.
 - (c) With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one to operable status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

- (d) A functional test at least once per 6 months and a channel calibration once per operating cycle to determine the operability of the protective instrumentation including simulated automatic actuation, tripping logic, output circuit breaker tripping, and verification of the setpoints.

Accordingly, I recommend the NRC approve the proposed design modification and Technical Specification changes for monitoring the electric power to the reactor protection system.

REFERENCES

1. General Electric Company letter, MFN 408-78 (G. G. Sherwood) to NRC (R. S. Boyd), dated October 31, 1978.
2. General Design Criteria-2 (GDC-2), "Design Bases for Protection Against Natural Phenomena," of Appendix A, "General Design Criteria for Nuclear Power Plants," in the Code of Federal Regulations, Title 10, Part 50 (10 CFR 50).
3. General Design Criteria-21 (GDC-21), "Protection System Reliability and Testability," of Appendix A, "General Design Criteria for Nuclear Power Plants," in the Code of Federal Regulations, Title 10, Part 50 (10 CFR 50).
4. IEEE Std. 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."
5. NUREG-75/087, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants."
6. NRC memorandum from Faust Rosa to J. Stolz, T. Ippolito, and G. Lainas, dated February 19, 1979.
7. NRC letter to Operating BWR's, dated September 24, 1980.
8. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (R. W. Reid), dated November 26, 1980.
9. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (R. W. Reid), dated March 9, 1981.
10. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (J. F. Stolz), dated October 30, 1981..
11. Philadelphia Electric Co. letter (E. J. Bradley) to NRC (H. R. Denton), dated December 23, 1981.

12. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (J. F. Stolz), dated May 21, 1982.
13. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (J. F. Stolz), dated November 8, 1982.
14. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (J. F. Stolz), dated March 30, 1983.
15. Philadelphia Electric Co. letter (S. L. Daltroff) to NRC (J. F. Stolz), dated June 2, 1983.
16. Telephone conference; W. Birely (PECo), G. Gears (NRC), and J. Selan (LLNL), dated September 12, 1983.
17. GE letter No. G-EE-8-86 (R. F. Thibault) to the Northeast Utilities Service Company (A. Roby).