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

April 13, 1989

Dockets Nos. 50-277/278

Mr. George A. Hunger, Jr.
Director-Licensing
Philadelphia Electric Company
Correspondence Control Desk
P. O. Box 7520
Philadelphia, Pennsylvania 19101

Dear Mr. Hunger:

SUBJECT: DEGRADED VOLTAGE PROTECTION (TAC NOS. 69292/69293)

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

The Commission has issued the enclosed Amendments Nos. 143 and 145 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 26, 1989 as supplemented with confirmatory information on March 6, 1989. The supplementary information did not alter or modify the application. The application of January 26, 1989 supersedes and replaces in its entirety an earlier application dated September 7, 1988.

These amendments modify the Technical Specifications to correct deficiencies in the degraded voltage protection features. The changes include (a) provision of separate undervoltage setpoints and associated time delays for transfer of the 4.16 KV buses to an alternative power supply for conditions when a safety injection signal (SIS) is present and for conditions when an SIS is not present, (b) decreasing the undervoltage relay setpoints on the 4.16 KV buses for conditions when an SIS is present, (c) changing the timing of adding the emergency core cooling system component loads to the preferred power supply when offsite power is available and (d) deletion of an extraneous footnote.

DFO1
1/1

CP-1 cc

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. 143 to DPR-44
2. Amendment No. 145 to DPR-56
3. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION: w/enclosures

Docket File	ACRS(10)
Brent Clayton	NRC PDR
GPA/PA	EWenzinger
Local PDR	OGC
PDI-2 Rdg.	RDiggs, ARM/LFMB
SVarga	TMeek(8)
BBoger	EJordan
WButler	DHagan
REMartin(2)	Wanda Jones
RClark	CMorris
MO'Brien(2)	EButcher
BGrimes	

[HUNGER LET]

PDI-2/LA	PDI-2/PM	OGC (NDR)	PDI-2/D
MO'Brien	REMartin:tr	NROMNEY	WButler
4/12/88	4/07/88	4/10/88	4/13/88

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,

Robert 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. 143 to DPR-44
2. Amendment No. 145 to DPR-56
3. Safety Evaluation

cc w/enclosures:
See next page

Mr. George A. Hunger, Jr.
Philadelphia Electric Company

Peach Bottom Atomic Power Station,
Units 2 and 3

cc:

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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. 143
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 on January 26, 1989, as supplemented on March 6, 1989 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. 143, 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

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 13, 1989

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MO'Brien	REMartin:tr	NROMNEY	WButler
4/12/89	4/04/89	4/10/89	4/13/89

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 143 , 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

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: April 13, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 143

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

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

Remove	Insert
67	67
71a	71a
93a	93a

TABLE 3.2.B

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
2	Core Spray Pump Start Timer	6 +/- 1 sec. 13 sec. +/-7% of setting 23 sec. +/-7% of setting	4 timers 2 timers 2 timers	All pumps-loss of offsite power only A & C pumps-offsite power available B & D pumps-offsite power available
2	LPCI Pump Start Timer (Four pumps)	2 sec. +/-7% of setting 8 sec. +/-7% of setting	4 timers 4 timers	LPCI pumps A & B LPCI pumps C & D
1	ADS Actuation Timer	90 </=t </= 120 seconds	2 timers	In conjunction with Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates ADS.
2	ADS Bypass Timer*	8 </= t </= 10 minutes	4 timers	In conjunction with low reactor water level, bypasses high drywell pressure initiation of ADS.
2	RHR (LPCI) Pump Discharge Pressure Interlock	50 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core Cooling system operation (LPCI Pump running interlock).
2	Core Spray Pump Discharge Pressure Interlock	185 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core cooling system operation (Core Spray Pump running interlock).

*Effective when modification associated with this amendment is complete.

Amendment No. 47, 96, 106, 143

TABLE 3.2.B (CONTINUED)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
2 per 4KV Bus	Emergency Transformer Undervoltage (IAV) (Inverse time-voltage)	60% (±5%) of rated voltage. Test at zero volts in 1.8 seconds (±10%).		1. Trips emergency transfer feed to 4kV emergency bus. 2. Fast transfer permissive.
2 per 4KV Bus	Degraded voltage (27N) ("non-LOCA" relay)	98% of rated voltage +0.3% of setting (4077 volts ± 12 volts) 0.9 - 1.1 second internal time delay 60 second ± 5% (±3 sec.) time delay		1. Trips emergency transformer feed to 4KV emergency bus. 2. Fast transfer permissive.
2 per 4KV Bus	Degraded voltage (27N) ("LOCA" relay)	89% of rated voltage ± 0.3% of setting (3702 volts ± 11 volts) 0.9 - 1.1 second internal time delay 9 second ± 7% (± 0.6 sec) time delay		1. Trips emergency transformer feed to 4KV emergency bus. 2. Fast transfer permissive. 3. Safety injection signal required.

Amendment No. 97, 143

3.2 BASES (Cont'd.)

The recirculation pump trip limits the consequences of an anticipated transient without scram (ATWS) event. The response of the plant to this postulated event is within the bounds of study events given in General Electric Company Topical Report, NEDO-10349, dated March, 1971. An alternate rod insertion scram limits the consequences of a Reactor Protection System failure to scram during an anticipated transient. The ARI/RPT System is electrically diverse from the RPS logic and actuation circuitry, which significantly reduces the potential for ATWS events caused by common mode electrical failures in RPS. The ARI/RPT system is required by 10 CFR 50.62.

In the event of a loss of the reactor building ventilation system, radiant heating in the vicinity of the main steam lines raises the ambient temperature above 200 degrees F. Restoration of the main steam line tunnel ventilation flow momentarily exposes the temperature sensors to high gas temperatures. The momentary temperature increase can cause an unnecessary main steam line isolation and reactor scram. Permission is provided to increase the temperature trip setpoint to 250 degrees F for 30 minutes during restoration of ventilation system to avoid an unnecessary plant transient.

The Emergency Aux. Power Source Degraded Voltage trip function prevents damage to safety-related equipment in the event of a sustained period of low voltage. The voltage supply to each of the 4kV buses will be monitored by undervoltage relaying. With a degraded voltage condition on the off-site source, the undervoltage sensing relays operate to initiate a timing sequence.

The timing sequence provides constant and inverse time voltage characteristics. Degraded voltage protection includes: (1) An instantaneous relay (27N) initiated at 98% voltage which initiates a 60 second time delay relay which is inhibited (locked out) from initiating transfer in the presence of a safety injection signal; (2) An instantaneous relay (27N) initiated at 89% voltage which intiates a 9 second time delay relay which requires the presence of a safety injection signal to initiate transfer; (3) An inverse time voltage relay (CV-6) initiated at 87% voltage with a maximum 60 second delay and operates at 70% voltage in 30 seconds; and (4) An inverse time voltage relay (IAV) initiated at approximately 60% voltage and operates at 1.8 seconds at zero volts.

When the timing sequence is completed, the corresponding 4kV emergency circuit breakers are tripped and the emergency buses are transferred to the alternate source. The 60-second timing sequences were selected to prevent unnecessary transfers during motor starts and to allow the automatic tapchanger on the startup transformer to respond to the voltage condition. The 9-second timing sequence is necessary to prevent separation of the emergency buses from the off-site source during motor starting transients, yet still be contained within the time envelope in FSAR Table 8.5.1.

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. 145
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 on January 26, 1989, as supplemented on March 6, 1989 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. 145 , 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

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 13, 1989

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MQuinlan	REMartin:tr	NRomney	WButler
4/12/89	4/6/89	4/10/89	4/13/89

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 145, 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

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: April 13, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 145

FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

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

Remove	Insert
67	67
71a	71a
93a	93a

TABLE 3.2.B

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
2	Core Spray Pump Start Timer	6 +/- 1 sec. 13 sec. +/-7% of setting 23 sec. +/-7% of setting	4 timers 2 timers 2 timers	All pumps-loss of offsite power only A & C pumps-offsite power available B & D pumps-offsite power available
2	LPCI Pump Start Timer (Four pumps)	2 sec. +/-7% of setting 8 sec. +/-7% of setting	4 timers 4 timers	LPCI pumps A & B LPCI pumps C & D
1	ADS Actuation Timer	90 </=t </= 120 seconds	2 timers	In conjunction with Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates ADS.
2	ADS Bypass Timer	8 </= t </= 10 minutes	4 timers	In conjunction with low reactor water level, bypasses high drywell pressure initiation of ADS.
2	RHR (LPCI) Pump Discharge Pressure Interlock	50 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core Cooling system operation (LPCI Pump running interlock).
2	Core Spray Pump Discharge Pressure Interlock	185 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core cooling system operation (Core Spray Pump running interlock).

TABLE 3.2.B (CONTINUED)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
2 per 4KV Bus	Emergency Transformer Undervoltage (IAV) (Inverse time-voltage)	60% (±5%) of rated voltage. Test at zero volts in 1.8 seconds (±10%).		1. Trips emergency transfer feed to 4kV emergency bus. 2. Fast transfer permissive.
2 per 4KV Bus	Degraded voltage (27N) ("non-LOCA" relay)	98% of rated voltage +0.3% of setting (4077 volts ± 12 volts) 0.9 - 1.1 second internal time delay 60 second ± 5% (±3 sec.) time delay		1. Trips emergency transformer feed to 4KV emergency bus. 2. Fast transfer permissive.
2 per 4KV Bus	Degraded voltage (27N) ("LOCA" relay)	89% of rated voltage ± 0.3% of setting (3702 volts ± 11 volts) 0.9 - 1.1 second internal time delay 9 second ± 7% (± 0.6 sec) time delay		1. Trips emergency transformer feed to 4KV emergency bus. 2. Fast transfer permissive. 3. Safety injection signal required.

3.2 BASES (Cont'd.)

The recirculation pump trip limits the consequences of an anticipated transient without scram (ATWS) event. The response of the plant to this postulated event is within the bounds of study events given in General Electric Company Topical Report, NEDO-10349, dated March, 1971. An alternate rod insertion scram limits the consequences of a Reactor Protection System failure to scram during an anticipated transient. The ARI/RPT System is electrically diverse from the RPS logic and actuation circuitry, which significantly reduces the potential for ATWS events caused by common mode electrical failures in RPS. The ARI/RPT system is required by 10 CFR 50.62.

In the event of a loss of the reactor building ventilation system, radiant heating in the vicinity of the main steam lines raises the ambient temperature above 200 degrees F. Restoration of the main steam line tunnel ventilation flow momentarily exposes the temperature sensors to high gas temperatures. The momentary temperature increase can cause an unnecessary main steam line isolation and reactor scram. Permission is provided to increase the temperature trip setpoint to 250 degrees F for 30 minutes during restoration of ventilation system to avoid an unnecessary plant transient.

The Emergency Aux. Power Source Degraded Voltage trip function prevents damage to safety-related equipment in the event of a sustained period of low voltage. The voltage supply to each of the 4kV buses will be monitored by undervoltage relaying. With a degraded voltage condition on the off-site source, the undervoltage sensing relays operate to initiate a timing sequence.

The timing sequence provides constant and inverse time voltage characteristics. Degraded voltage protection includes: (1) An instantaneous relay (27N) initiated at 98% voltage which initiates a 60 second time delay relay which is inhibited (locked out) from initiating transfer in the presence of a safety injection signal; (2) An instantaneous relay (27N) initiated at 89% voltage which intiates a 9 second time delay relay which requires the presence of a safety injection signal to initiate transfer; (3) An inverse time voltage relay (CV-6) initiated at 87% voltage with a maximum 60 second delay and operates at 70% voltage in 30 seconds; and (4) An inverse time voltage relay (IAV) initiated at approximately 60% voltage and operates at 1.8 seconds at zero volts.

When the timing sequence is completed, the corresponding 4kV emergency circuit breakers are tripped and the emergency buses are transferred to the alternate source. The 60-second timing sequences were selected to prevent unnecessary transfers during motor starts and to allow the automatic tapchanger on the startup transformer to respond to the voltage condition. The 9-second timing sequence is necessary to prevent separation of the emergency buses from the off-site source during motor starting transients, yet still be contained within the time envelope in FSAR Table 8.5.1.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENT NOS. 143 AND 145 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 January 26, 1989, as supplemented with confirmatory information on March 6, 1989, the 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 March 6, 1989 letter submitted voltage regulation studies that had been completed in January 1989. The amendments would modify the Technical Specifications (TS) to correct deficiencies in the degraded voltage protection features that were identified as a result of revised voltage regulation studies. The studies were based in part on the consideration that, under certain offsite power emergency conditions, the voltage provided to the station's offsite power supply transformers could be lower than previously assumed. The study also modeled the plant's power distribution system to a greater level of detail.

The proposed changes are grouped into two categories. The Category A changes involve the degraded voltage protection relays. Category B changes address the Emergency Core Cooling System (ECCS) loading sequence. Specifically these changes to TS section 3.2 are as follows:

1. Provision of separate undervoltage relays with their associated time delay for transfer of the 4.16KV buses to an alternative power supply for conditions involving the presence of a safety injection signal (SIS) and for conditions not involving an SIS. Specifically, at 98% of rated voltage, a 60 second time delay is actuated; at 89% of rated voltage, with a concurrent SIS, a 9 second time delay is actuated.

   Previously there was one undervoltage setpoint at 90% of rated voltage with time delays of 60 seconds for non-SIS conditions and 6 seconds for a concurrent SIS.

2. Change the timing of the Emergency Core Cooling System initiations when offsite power (OSP) is available; the timing will not change when offsite power is unavailable.

FORMER ECCS SEQUENCE

Time [seconds]	Components started
0	480V Safety Loads RHR pumps A,B
5	RHR pumps C,D
10	CS pumps A,B,C,D

This starting sequence would be expected to result in voltage dips of sufficient severity to cause transfer of loads to the diesel generators rather than to the remaining offsite power source.

PROPOSED ECCS SEQUENCE

Time [seconds]	Components started
0	480V Safety Loads
2	RHR pumps A,B
8	RHR pumps C,D
13	CS pumps A,C
23	CS pumps B,D

3. Delete a footnote relating to modifications to the Unit 3 ADS bypass timer. The footnote is said to no longer be needed because the modifications have been completed.

2.0 BACKGROUND AND DISCUSSION

Each Peach Bottom unit has four 4.16kv buses supplied by two offsite power supplies and four emergency diesel generators. Each unit has two safety divisions with two 4.16kv buses each. The alternate or preferred power supply for any 4.16kv bus is, in order of preference, the remaining offsite power source, then the emergency diesel generator (EDG). One preferred power supply (PPS) feeds one 4.16kv bus in each division; the other is supplied by the alternate offsite power supply. For clarification see figures attached. Each diesel generator feeds one 4.16kv safety bus in each unit. Each startup source to each 4.16kv safety bus is equipped with an instantaneous undervoltage protective relay (UVR). These relays were previously set to initiate at .90 pu of nominal voltage on the 4.16kv buses. The undervoltage relay initiates delayed transfers to the alternate power supply and then to the EDG, if the alternate power supply voltage falls below the undervoltage relay setpoint for a time exceeding the time delay relay (TDR) setpoint. The control circuit logic

to the time delay relay circuitry distinguishes between low voltages with and without a concurrent safety injection signal (SIS). Without an SIS, a 60 second delay allows time for tap changers to recover voltage. With an SIS, another time delay relay will initiate transfer from one preferred power supply (PPS) to the alternate, after six seconds. The January 1989 voltage regulation study identified an inadequacy in the six second time delay setting, given an SIS and only one of the two preferred power supplies connected. The inadequacy revealed is the excessive accelerating time required for the core spray pumps (CS) to come up to speed with the present worst case low voltage condition on the preferred power supplies namely: .934 pu. The failure to accelerate in time would cause the emergency bus voltage to remain low so that a transfer of the 4.16kv bus to another power supply would unnecessarily, occur.

The licensee has proposed the following Technical Specification changes:

Proposed Changes with SIS

1) Change settings of undervoltage relay (UVR) from .90 to .89 pu; with SIS present.

2) Change time delay relay (TDR) setting from six seconds to nine seconds with SIS present.

Under single PPS operation and the previous load sequence scheme, the CS pumps would need in excess of 17 seconds to accelerate. Category A changes 1 and 2 above are plainly insufficient, by themselves to correct the problem. Under the licensee's proposed revised loading scheme, to be completed prior to restart, the CS pump will accelerate in the worst case within nine seconds. The proposed technical specification changes also entailed changes to tables 3.2.B and Bases section 3.2 to correctly describe the new relays and setting changes when an SIS is present. Undervoltages without an SIS present would also cause safety bus transfers to alternate power supplies, were it not for additional relaying now proposed. The licensee proposes to add a UVR set at .98 pu with an associated TDR of 60 seconds to operate only in the absence of an SIS. The .98 pu setting is needed to ensure an acceptable voltage level to motor control center (MCC) loads (460 and 120 VAC). The licensee has stated that contactors are the limiting case control components and that, following installation of the proposed protective relaying, the safety system components will be adequately protected and capable of performing their safety function.

In addition to the proposed ECCS loading sequence, the licensee will further improve the voltage regulation of the 480V load centers during a motor starting transient by a combination of plant modifications which revise the load shedding or sequencing of the emergency service water pumps, the emergency cooling water pump, the RHR compartment coolers, the

cooling towers and the diesel generator vent supply fans. The licensee plans to perform these changes pursuant to 10 CFR 50.59 since none involves an unreviewed safety question or a change to the Technical Specifications.

The Appendix K (ECCS Evaluation Models) analysis was used to determine bounding allowable starting times for the RHR and CS pumps. The licensee concluded that the proposed increases in the core spray timer settings are within the Appendix K analysis. Success of the core spray system requires two factors: 1) pump ready for rated flow and 2) injection valve open to permit full flow. The earliest time assumed in the Appendix K analysis that the injection valve can be opened is 59 seconds of which 12 seconds is valve stroke time, and the pumps must be ready for full flow prior to this time. The series of events contributing to the establishment of the pumps ready for rated flow are the sensor times for detection of the LOCA, the time for power to be available at the emergency bus, the time for power to be available to the pump motor and pump motor acceleration time. Taking into account the above equipment operational time requirements, the CS timer setting must be less than 47 seconds. Thus, the proposed 13 and 23 second timer settings are within the analyzed condition.

The licensee has similarly concluded that the proposed increases in RHR pump timer settings are in accordance with the Appendix K analysis. Success of the low pressure coolant injection (LPCI) mode of the RHR system requires three factors: 1) pump ready for rated flow, 2) injection valve open to permit full flow and 3) full closure of the recirculation discharge valve. Under the limiting scenario, 57 seconds are available for the RHR pumps to start and accelerate to rated speed. Taking into account the sensor and acceleration delays, the RHR timer setting must be less than 50.9 seconds. Thus, the proposed 2 and 8 second timer settings are within the analyzed condition. Neither of these changes involves additional loading onto the DC system. All replacement and additional relays resulting from these changes will be located in existing safety-related panels. The control relays provided will equal or exceed the ratings of the existing relays and meet the applicable design requirements for environmental and seismic qualification.

An additional change is proposed to the Unit 3 Technical Specifications only to delete a footnote which is no longer required since the modification associated with the ADS bypass timer (Modification 633) was completed for Unit 3 on February 24, 1986. Removing the footnote will eliminate the need to check the status of the modification to determine the applicability of the specification. The licensee proposes this administrative change to enhance safety by reducing the effort required to interpret the specification.

3.0 EVALUATION

The proposed technical specification changes to the undervoltage relay and time delay relay setpoints are acceptable to the staff subject to completion of the following items.

1) Revision of the UFSAR in the next update to include the new timing sequence, described above, and other associated timing changes (e.g. cooling tower loads) not documented in the Technical Specifications.

2) Completion of modifications to ensure the adequacy of .85 pu of rated voltage at MCC contactors with .98 pu minimum voltage on 4.16kv safety buses prior to the next restart of each unit.

The proposed changes to undervoltage and time delay settings on safety buses and changes to ECCS and related system loading sequences are acceptable to the staff because they ameliorate the low voltages found in the electrical distribution systems of both units, both in the balance of plant and in the safety system levels, when the preferred power supply voltage is low and when only one preferred power supply can be connected to onsite loads. The frequency with which these conditions occur has been low and is expected to remain so, so that, usually, onsite voltages will be higher than the worst case analyzed. Overvoltage, another concern when the undervoltage relay is set at .98 pu, is a lesser concern if limited in time and voltage as licensee's analysis shows it should be. The administrative changes are also acceptable because they improve the consistency and implementation capability of the Technical Specification.

4.0 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. 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.

5.0 CONCLUSION

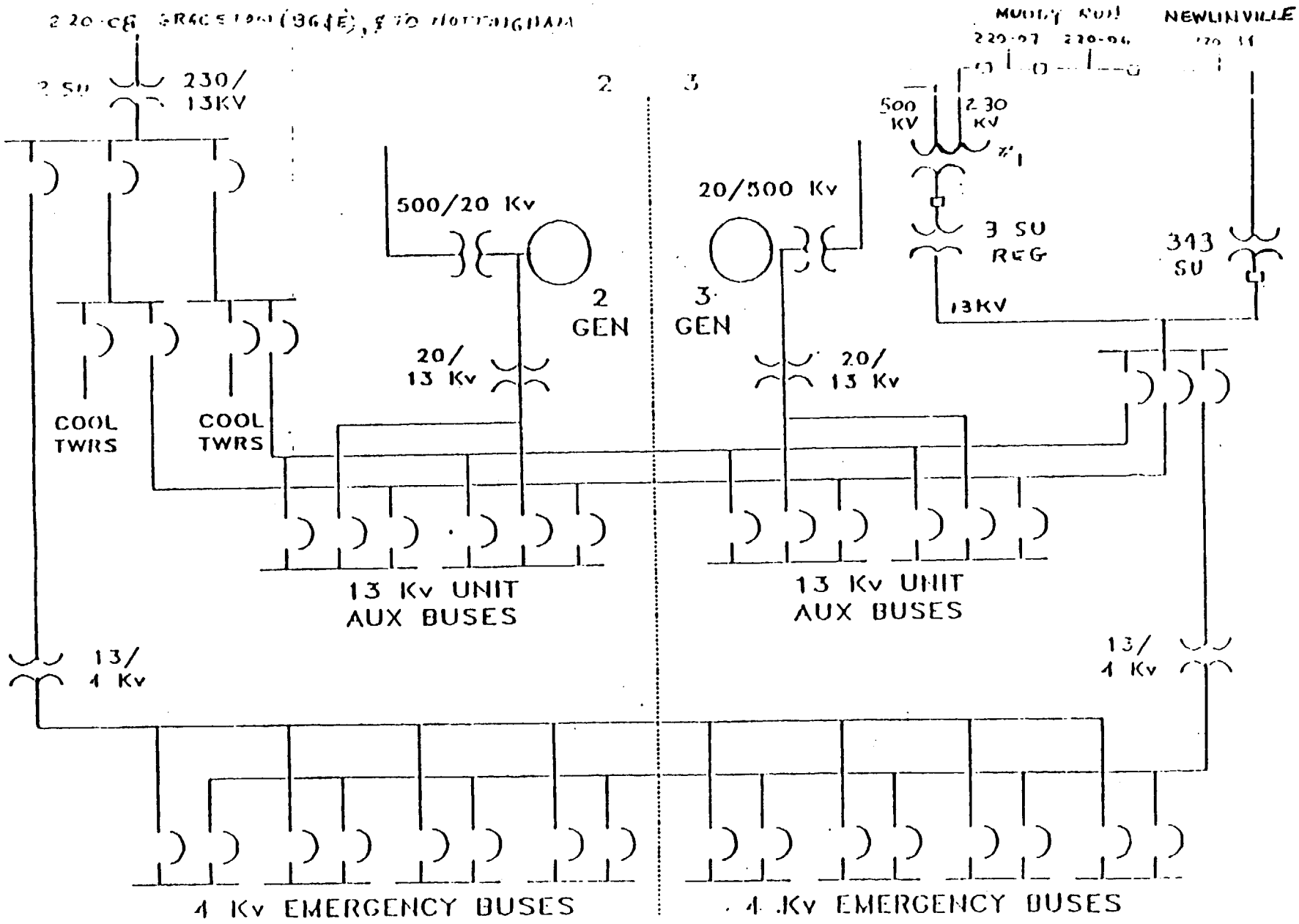
The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (53 FR 40996) on October 19, 1988 and consulted with the State of Pennsylvania. No public comments were received and the State of Pennsylvania did 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 Contributors: Charles E. Morris, Robert E. Martin

Dated: April 13, 1989

FIGURE 1



PEACH BOTTOM

FIGURE 2

PEACH BOTTOM
TYPICAL 4 KV SAFEGUARD BUS

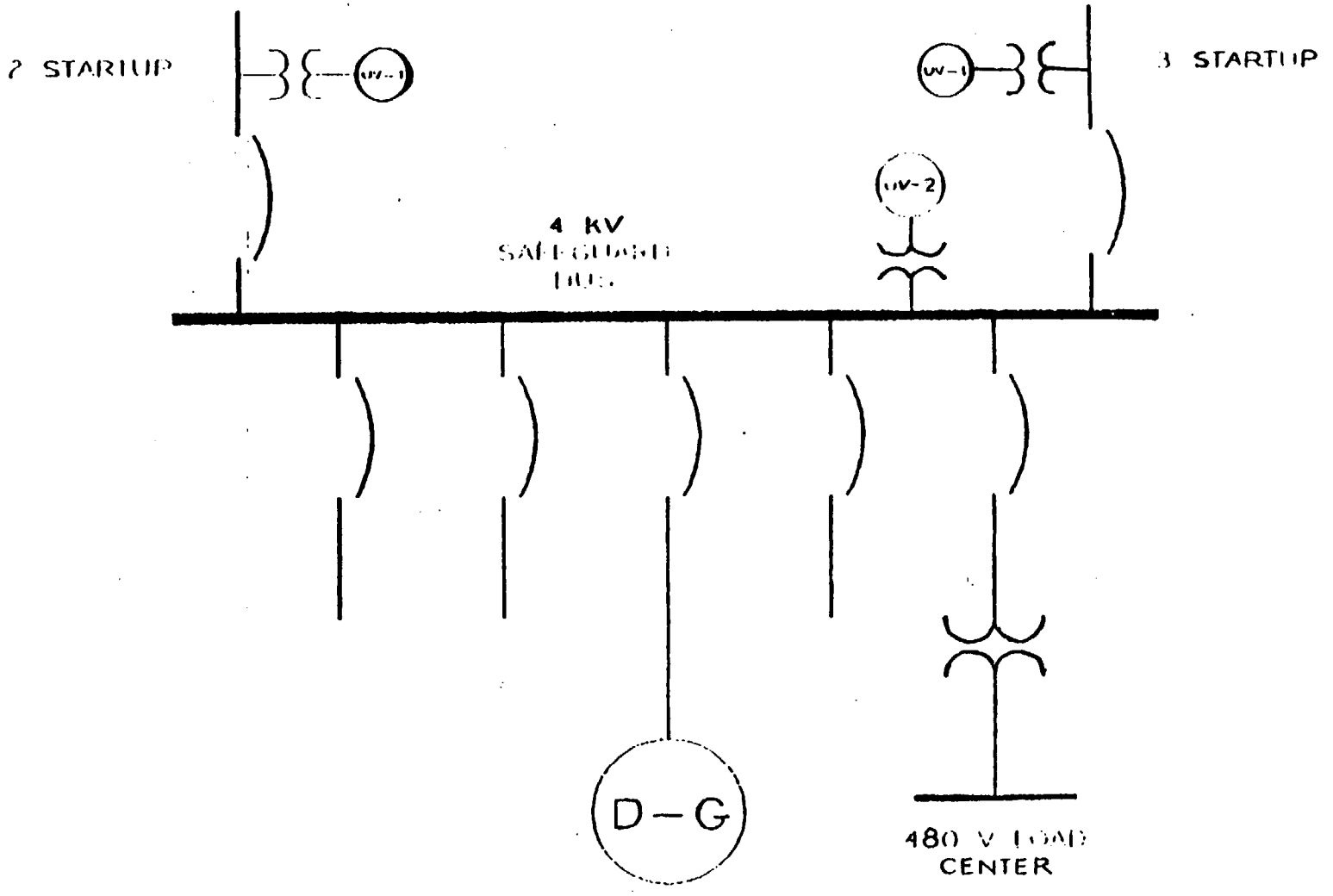
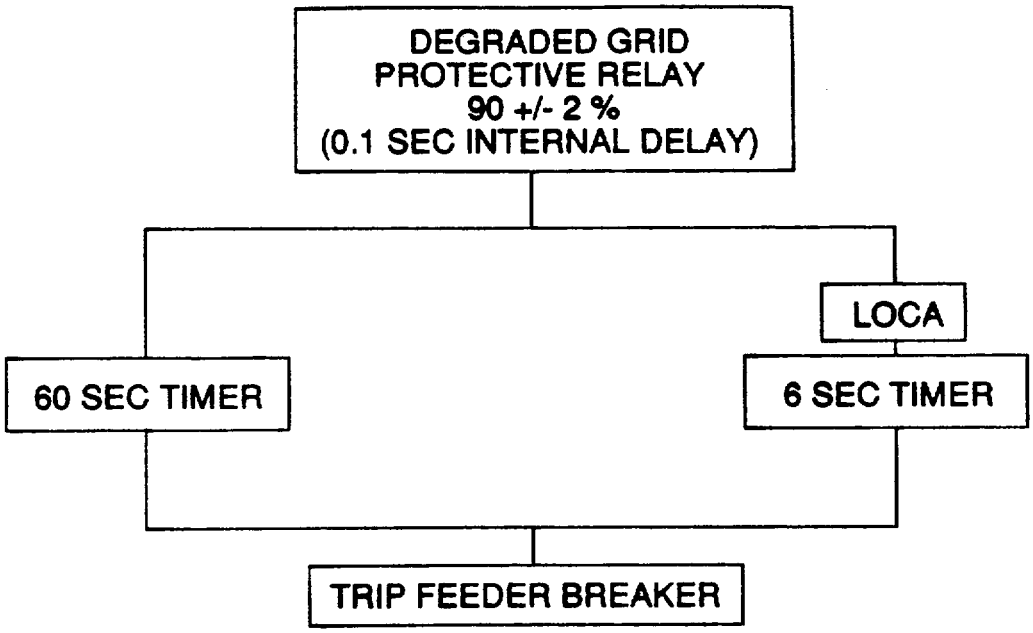
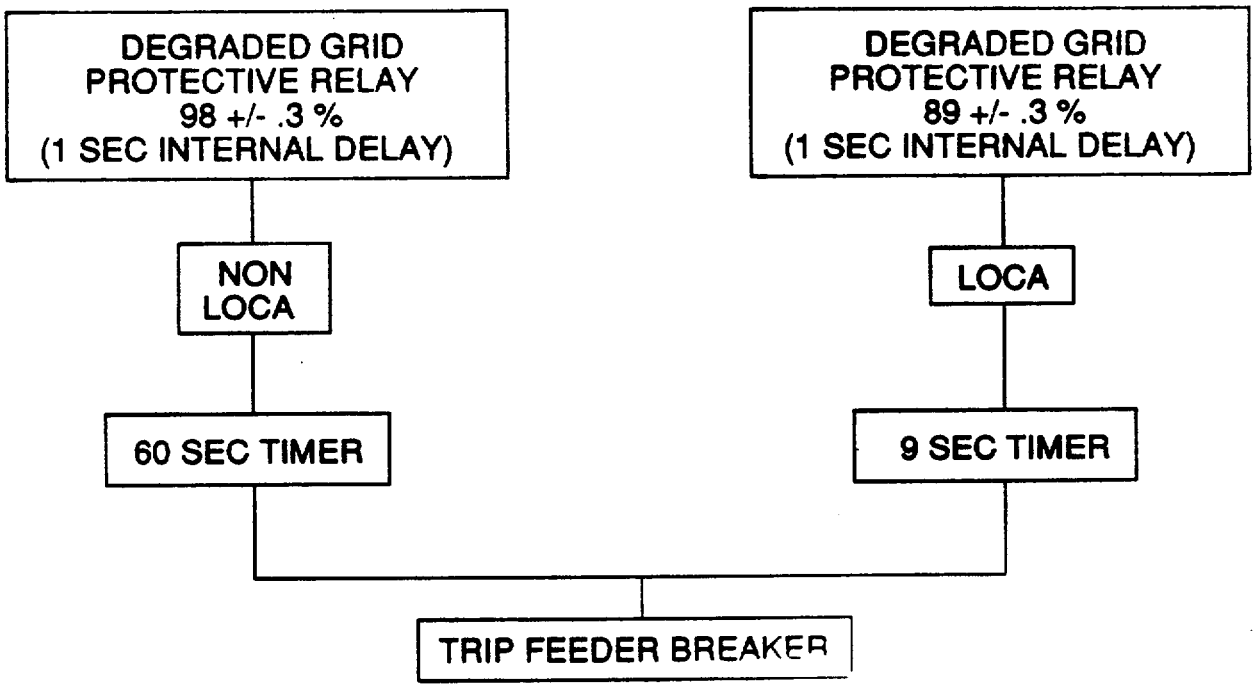


FIGURE 3

PHILADELPHIA ELECTRIC COMPANY
PEACH BOTTOM ATOMIC POWER STATION



EXISTING DEGRADED GRID PROTECTIVE RELAY LOGIC



PROPOSED DEGRADED GRID PROTECTIVE RELAY LOGIC