

January 27, 1995

Mr. George A. Hunger, Jr.  
Director-Licensing, MC 62A-1  
PECO Energy Company  
Nuclear Group Headquarters  
Correspondence Control Desk  
P.O. Box No. 195  
Wayne, PA 19087-0195

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M90377/M90378,  
AND M90504/M90505/M90510/M90511)

Dear Mr. Hunger:

The Commission has issued the enclosed Amendment No. 87 to Facility Operating License No. NPF-39 and Amendment No. 49 to Facility Operating License No. NPF-85 for the Limerick Generating Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to two items addressed in your application dated August 22, 1994. There are three items in your application not yet reviewed.

These amendments revise TS 3.1.5, "Standby Liquid Control System," to remove the requirement for the standby liquid control system to be operable in OPERATIONAL CONDITION 5, Refueling, when any control rod is withdrawn and the TS definition of CORE ALTERATION to exclude control rod movement in a control cell that contains no fuel assemblies.

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

Sincerely,

Original signed by

Frank Rinaldi, Project Manager  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

9502080370 950127  
PDR ADOCK 05000352  
P PDR

Docket Nos. 50-352/50-353  
Enclosures: 1. Amendment No. 87 to  
License No. NPF-39  
Amendment No. 49 to  
License No. NPF-85  
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

Docket File MO'Brien  
PUBLIC FRinaldi/JShea  
PDI-2 Reading OGC  
SVarga OPA  
JZwolinski GHill(2)  
JStolz

CGrimes  
RJones  
ACRS(4)  
OC/LFDCB  
CAnderson, RGN-I

DFD  
NRC FILE CENTER COPY

\*Previously Concurred

OFFICE	LA:PDI-2	PM:PDI-2	PM:PDI-2	BC:SRXB*	OGC*	AD:PDI-2
NAME	MO'Brien	JZimmerman:bf	FRinaldi	RJones	CPW	JStolz
DATE	01/26/95	01/26/95	01/24/95	01/13/95	01/19/95	01/26/95



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

January 27, 1995

Mr. George A. Hunger, Jr.  
Director-Licensing, MC 62A-1  
PECO Energy Company  
Nuclear Group Headquarters  
Correspondence Control Desk  
P.O. Box No. 195  
Wayne, PA 19087-0195

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M90377/M90378,  
AND M90504/M90505/M90510/M90511)

Dear Mr. Hunger:

The Commission has issued the enclosed Amendment No. 87 to Facility Operating License No. NPF-39 and Amendment No. 49 to Facility Operating License No. NPF-85 for the Limerick Generating Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to two items addressed in your application dated August 22, 1994. There are three items in your application not yet reviewed.

These amendments revise TS 3.1.5, "Standby Liquid Control System," to remove the requirement for the standby liquid control system to be operable in OPERATIONAL CONDITION 5, Refueling, when any control rod is withdrawn and the TS definition of CORE ALTERATION to exclude control rod movement in a control cell that contains no fuel assemblies.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "Frank Rinaldi".

Frank Rinaldi, Project Manager  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352/50-353

Enclosures: 1. Amendment No. 87 to  
License No. NPF-39  
Amendment No. 49 to  
License No. NPF-85  
2. Safety Evaluation

cc w/encls: See next page

PECO Energy Company

Limerick Generating Station,  
Units 1 & 2

cc:

J. W. Durham, Sr., Esquire  
Sr. V.P. & General Counsel  
PECO Energy Company  
2301 Market Street  
Philadelphia, Pennsylvania 19101

Mr. Rich R. Janati, Chief  
Division of Nuclear Safety  
PA Dept. of Environmental Resources  
P. O. Box 8469  
Harrisburg, Pennsylvania 17105-8469

Mr. David P. Helker, 62A-1  
Manager-Limerick Licensing  
PECO Energy Company  
965 Chesterbrook Boulevard  
Wayne, Pennsylvania 19087-5691

Mr. James A. Muntz  
Superintendent-Technical  
Limerick Generating Station  
P. O. Box A  
Sanatoga, Pennsylvania 19464

Mr. David R. Helwig, Vice President  
Limerick Generating Station  
Post Office Box A  
Sanatoga, Pennsylvania 19464

Mr. James L. Kantner  
Manager-Experience Assessment  
Limerick Generating Station  
P. O. Box A  
Sanatoga, Pennsylvania 19464

Mr. Robert Boyce  
Plant Manager  
Limerick Generating Station  
P.O. Box A  
Sanatoga, Pennsylvania 19464

Library  
US Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Mr. Larry Hopkins  
Superintendent-Operations  
Limerick Generating Station  
P. O. Box A  
Sanatoga, Pennsylvania 19464

Mr. Neil S. Perry  
Senior Resident Inspector  
US Nuclear Regulatory Commission  
P. O. Box 596  
Pottstown, Pennsylvania 19464

Mr. George A. Hunger, Jr.  
Director-Licensing, MC 62A-1  
PECO Energy Company  
Nuclear Group Headquarters  
Correspondence Control Desk  
P.O. Box 195  
Wayne, PA 19087-0195

Mr. Craig L. Adams  
Superintendent - Services  
Limerick Generating Station  
P.O. Box A  
Sanatoga, Pennsylvania 19464

Dr. Judith Johnsrud  
National Energy Committee  
Sierra Club  
433 Orlando Avenue  
State College, PA 16803

John Doering, Chairman  
Nuclear Review Board  
PECO Energy Company  
965 Chesterbrook Boulevard  
Mail Code 63C-5  
Wayne, Pennsylvania 19087



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

PHILADELPHIA ELECTRIC COMPANY  
DOCKET NO. 50-352  
LIMERICK GENERATING STATION, UNIT 1  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 87  
License No. NPF-39

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Philadelphia Electric Company (the licensee) dated August 22, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health 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. NPF-85 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 87, are hereby incorporated into this license. Philadelphia Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



for

John F. Stolz, Director  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the  
Technical Specifications

Date of Issuance: January 27, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 87

FACILITY OPERATING LICENSE NO. NPF-39

DOCKET NO. 50-352

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove

1-2

3/4 1-19

Insert

1-2

3/4 1-19

## DEFINITIONS

### CORE ALTERATION

1.7 CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:

- a) Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special moveable detectors (including undervessel replacement); and
- b) Control rod movement, provided there are no fuel assemblies in the associated core cell.

Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

### CORE OPERATING LIMITS REPORT

1.7a The CORE OPERATING LIMITS REPORT (COLR) is the unit-specific document that provides the core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specifications 6.9.1.9 thru 6.9.1.12. Plant operation within these limits is addressed in individual specifications.

### CRITICAL POWER RATIO

1.8 The CRITICAL POWER RATIO (CPR) shall be the ratio of that power in the assembly which is calculated by application of the (GEXL) correlation to cause some point in the assembly to experience boiling transition, divided by the actual assembly operating power.

### DOSE EQUIVALENT I-131

1.9 DOSE EQUIVALENT I-131 shall be that concentration of I-131, microcuries per gram, which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

### DOWNSCALE TRIP SETPOINT (DTSP)

1.9a The downscale trip setpoint associated with the Rod Block Monitor (RBM) rod block trip setting.

### E-AVERAGE DISINTEGRATION ENERGY

1.10  $\bar{E}$  shall be the average, weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling, of the sum of the average beta and gamma energies per disintegration, in MeV, for isotopes, with half lives greater than 15 minutes, making up at least 95% of the total noniodine activity in the coolant.

### EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME

1.11 The EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS actuation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function, i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc. Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by any series of sequential, overlapping or total steps such that the entire response time is measured.

## REACTIVITY CONTROL SYSTEMS

### 3/4.1.5 STANDBY LIQUID CONTROL SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.1.5 The standby liquid control system consisting of a minimum of two pumps and corresponding flow paths, shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2

ACTION:

- a. In OPERATIONAL CONDITION 1 or 2:
  1. With only one pump and corresponding explosive valve OPERABLE, restore one inoperable pump and corresponding explosive valve to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.
  2. With standby liquid control system otherwise inoperable, restore the system to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.1.5 The standby liquid control system shall be demonstrated OPERABLE:

- a. At least once per 24 hours by verifying that:
  1. The temperature of the sodium pentaborate solution is within the limits of Figure 3.1.5-1.
  2. The available volume of sodium pentaborate solution is at least 3160 gallons.
  3. The temperature of the pump suction piping is within the limits of Figure 3.1.5-1 for the most recent concentration analysis.



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

PHILADELPHIA ELECTRIC COMPANY  
DOCKET NO. 50-353  
LIMERICK GENERATING STATION, UNIT 2  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 49  
License No. NPF-85

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Philadelphia Electric Company (the licensee) dated August 22, 1994, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health 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. NPF-39 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 49, are hereby incorporated into this license. Philadelphia Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



J. F. Stolz  
F. J.

John F. Stolz, Director  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the  
Technical Specifications

Date of Issuance: January 27, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 49

FACILITY OPERATING LICENSE NO. NPF-85

DOCKET NO. 50-353

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove

1-2

3/4 1-19

Insert

1-2

3/4 1-19

## DEFINITIONS

### CORE ALTERATION

1.7 CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:

- a) Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special moveable detectors (including undervessel replacement); and
- b) Control rod movement, provided there are no fuel assemblies in the associated core cell.

Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

### CORE OPERATING LIMITS REPORT

1.7a The CORE OPERATING LIMITS REPORT (COLR) is the unit-specific document that provides the core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specifications 6.9.1.9 thru 6.9.1.12. Plant operation within these limits is addressed in individual specifications.

### CRITICAL POWER RATIO

1.8 The CRITICAL POWER RATIO (CPR) shall be the ratio of that power in the assembly which is calculated by application of the (GEXL) correlation to cause some point in the assembly to experience boiling transition, divided by the actual assembly operating power.

### DOSE EQUIVALENT I-131

1.9 DOSE EQUIVALENT I-131 shall be that concentration of I-131, microcuries per gram, which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

### DOWNSCALE TRIP SETPOINT (DTSP)

1.9a The downscale trip setpoint associated with the Rod Block Monitor (RBM) rod block trip setting.

### E-AVERAGE DISINTEGRATION ENERGY

1.10  $\bar{E}$  shall be the average, weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling, of the sum of the average beta and gamma energies per disintegration, in MeV, for isotopes, with half lives greater than 15 minutes, making up at least 95% of the total noniodine activity in the coolant.

### EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME

1.11 The EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS actuation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function, i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc. Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by any series of sequential, overlapping or total steps such that the entire response time is measured.

## REACTIVITY CONTROL SYSTEMS

### 3/4.1.5 STANDBY LIQUID CONTROL SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.1.5 The standby liquid control system, consisting of a minimum of two pumps and corresponding flow paths, shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2

ACTION:

- a. In OPERATIONAL CONDITION 1 or 2:
  1. With only one pump and corresponding explosive valve OPERABLE, restore one inoperable pump and corresponding explosive valve to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.
  2. With standby liquid control system otherwise inoperable, restore the system to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.1.5 The standby liquid control system shall be demonstrated OPERABLE:

- a. At least once per 24 hours by verifying that:
  1. The temperature of the sodium pentaborate solution is within the limits of Figure 3.1.5-1.
  2. The available volume of sodium pentaborate solution is at least 3160 gallons.
  3. The temperature of the pump suction piping is within the limits of Figure 3.1.5-1 for the most recent concentration analysis.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 87 AND 49 TO FACILITY OPERATING  
LICENSE NOS. NPF-39 AND NPF-85  
PHILADELPHIA ELECTRIC COMPANY  
LIMERICK GENERATING STATION, UNITS 1 AND 2  
DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated August 22, 1994, the Philadelphia Electric Company (the licensee) submitted a request for changes to the Limerick Generating Station, Units 1 and 2, Technical Specifications (TS). The request consisted of five items: (1) control rod block instrumentation, (2) standby liquid control system operability in Mode 5 (3) scram discharge volume valve testing, (4) optional method of scram timing, and (5) definition of core alteration. This amendment addresses two of those items. There are three remaining items to be reviewed in the application. These amendments revise (1) TS 3/4.1.5, "Standby Liquid Control System," (SLCS), to remove the operability requirement for the SLCS in Operational Condition (OPCON) 5, Refueling, with any control rod withdrawn and (2) the TS definition of CORE ALTERATION to exclude control rod movement in a control cell that contains no fuel assemblies.

2.0 EVALUATION

The purpose of the SLC system is to provide the capability of shutting down the reactor from a full power condition, and maintaining it subcritical until the cold shutdown condition is achieved without control rod movement. The SLCS injects sodium pentaborate solution into the reactor core upon initiation. In OPCON 5, the reactor is already shut down with control rods fully inserted in any core cells that have fuel assemblies in them.

The one-rod-out interlock associated with the Refuel position of the reactor mode switch provides protection against inadvertent criticality while the reactor is in OPCON 5. Specifically, the reactor mode switch will be in the Refuel position (and locked) and this initiates the Refuel position one-rod-out interlock which prevents the selection of a second control rod for movement when any other control rod is not fully inserted. The core is designed such that adequate shutdown margin (SDM) is maintained with one control rod fully withdrawn.

Additional protection against inadvertent criticality is also achieved in OPCON 5 because in accordance with TS and procedural controls, the amount of reactivity present in the core will be constantly reduced during core offloading. This means that the SDM of the core is the same or greater than its initial value during the entire core offloading process. SDM is analytically determined prior to fuel being reloaded into the reactor vessel. The calculated SDM is the acceptance criterion used in TS Surveillance Requirement 4.1.1. If a control rod is withdrawn in OPCON 5 and SDM has not been demonstrated (i.e., during reload) additional restrictions are placed on the plant by TSs 3/4.9.2 and 3/4.10.3. Specifically, if adequate SDM has not been demonstrated, at least two source range monitor channels must be operable with the shorting links removed from the reactor protection system (RPS) circuitry prior to and any time one control rod is withdrawn. In the extremely unlikely event that an inadvertent criticality occurs during this time, these additional restrictions assure that the control rod system will be automatically actuated by the RPS.

The NRC staff has concluded that the SLCS should not be required to be operable in OPCON 5 when any control rod is withdrawn since adequate SDM in conjunction with TS requirements for operability of the Refuel position one-rod-out interlock will assure that an inadvertent criticality event will not occur during refueling operations. The staff, therefore, finds the TS changes proposed by the licensee to be acceptable.

The current TS definition of CORE ALTERATION includes control rod movement in a control cell that contains no fuel assemblies. The licensee has proposed to exclude this item from the definition since the movement of a control rod by methods other than normal control rod drive is not a core alteration when there are no fuel assemblies in the associated core cell. The definition change will eliminate the requirement to have an SRO or LSRO supervise control rod withdrawal in the off-loaded cell. When the fuel assemblies surrounding the control rod are removed, there is no significant reactivity change from movement. Therefore, movement of control rods in such a manner should not reduce the SDM. This change adopts the definition of the staff approved improved BWR-4 TS (NUREG-1433). The staff has reviewed the licensee's proposal and finds the proposed definition of core alteration acceptable.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no

significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 55881). 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.

#### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Zimmerman

Date: January 27, 1995