

February 11, 1997

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. M96635 AND M96636)

Dear Mr. Hunger:

The Commission has issued the enclosed Amendment No. 122 to Facility Operating License No. NPF-39 and Amendment No. 86 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 your application dated September 27, 1996.

These amendments increase the reactor enclosure secondary containment maximum inleakage rate, and also impact secondary containment drawdown time and system flow rate assumptions, thereby, affecting charcoal filter bed efficiency and post accident dose analysis.

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

Sincerely,

/s/

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

Docket Nos. 50-352/353

- Enclosures: 1. Amendment No. 122 to License No. NPF-39
- 2. Amendment No. 86 to License No. NPF-85
- 3. Safety Evaluation

NRC FILE CENTER COPY

cc w/encls: See next page

DISTRIBUTION:

Docket File	MO'Brien	CGrimes	CBerlinger
PUBLIC	FRinaldi	CMiller	RGoel
PDI-2 Reading	OGC	REmch	ACRS
SVarga	GHill(4)	JLee	
JStolz	WPasciak, RGN-I		

DF 01/11

OFFICE	PDI-2/A	PDI-2/PM	PERB	SCSB	OGC	(PDI-2/D)
NAME	MO'Brien	FRinaldi	CMiller	CBerlinger	WVarga	JStolz
DATE	1/24/97	1/24/97	1/24/97	1/24/97	2/7/97	2/11/97

OFFICIAL RECORD COPY
DOCUMENT NAME: LI96635.AMD

WV
RC Emch
1/24/97

9702190189 970211
PDR ADOCK 05000352
PDR



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 11, 1997

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. M96635 AND M96636)

Dear Mr. Hunger:

The Commission has issued the enclosed Amendment No. 122 to Facility Operating License No. NPF-39 and Amendment No. 86 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 your application dated September 27, 1996.

These amendments increase the reactor enclosure secondary containment maximum inleakage rate, and also impact secondary containment drawdown time and system flow rate assumptions, thereby, affecting charcoal filter bed efficiency and post accident dose analysis.

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. 50-352/353

Enclosures: 1. Amendment No. 122 to
License No. NPF-39
2. Amendment No. 86 to
License No. NPF-85
3. Safety Evaluation

cc w/encls: See next page

Mr. George A. Hunger, Jr.
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, PA 19101

Chief-Division of Nuclear Safety
PA Dept. of Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Manager-Limerick Licensing, 62A-1
PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

Director-Site Engineering
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Mr. Walter G. MacFarland, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, PA 19464

Manager-Experience Assessment
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

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

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

Senior Manager-Operations
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Limerick Generating Station
P.O. Box 596
Pottstown, PA 19464

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

Director-Site Support Services
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Chairman
Board of Supervisors
of Limerick Township
646 West Ridge Pike
Linfield, PA 19468



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.122
License No. NPF-39

- I. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Philadelphia Electric Company (the licensee) dated September 27, 1996, 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.

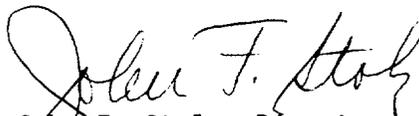
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-39 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 122, 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



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: February 11, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 122

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.

<u>Remove</u>	<u>Insert</u>
3/4 6-46	3/4 6-46
3/4 6-53	3/4 6-53
3/4 6-54	3/4 6-54
B 3/4 6-5	B 3/4 6-5
B 3/4 6-6	B 3/4 6-6

CONTAINMENT SYSTEMS

3/4.6.5 SECONDARY CONTAINMENT

REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.5.1.1 REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

Without REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY, restore REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1.1 REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY shall be demonstrated by:

- a. Verifying at least once per 24 hours that the pressure within the reactor enclosure secondary containment is greater than or equal to 0.25 inch of vacuum water gauge.
- b. Verifying at least once per 31 days that:
 1. All reactor enclosure secondary containment equipment hatches and blowout panels are closed and sealed.
 2. At least one door in each access to the reactor enclosure secondary containment is closed.
 3. All reactor enclosure secondary containment penetrations not capable of being closed by OPERABLE secondary containment automatic isolation dampers/valves and required to be closed during accident conditions are closed by valves, blind flanges, slide gate dampers or deactivated automatic dampers/valves secured in position.
- c. At least once per 24 months:
 1. Verifying that one standby gas treatment subsystem will draw down the reactor enclosure secondary containment to greater than or equal to 0.25 inch of vacuum water gauge in less than or equal to 916 seconds with the reactor enclosure recirc system in operation and
 2. Operating one standby gas treatment subsystem for one hour and maintaining greater than or equal to 0.25 inch of vacuum water gauge in the reactor enclosure secondary containment at a flow rate not exceeding 2500 cfm with wind speeds of ≤ 7.0 mph as measured on the wind instrument on Tower 1, elevation 30' or, if that instrument is unavailable, Tower 2, elevation 159'.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 24* months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire, or chemical release in any ventilation zone communicating with the subsystem by:
1. Verifying that the subsystem satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 0.05% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 5764 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 0.175%; and
 3. Verify that when the fan is running the subsystem flowrate is 2800 cfm minimum from each reactor enclosure (Zones I and II) and 2200 cfm minimum from the refueling area (Zone III) when tested in accordance with ANSI N510-1980.
 4. Verify that the pressure drop across the refueling area to SGTS prefilter is less than 0.25 inches water gage while operating at a flow rate of 2400 cfm \pm 10%.
- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 0.175%.
- d. At least once per 24 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 9.1 inches water gauge while operating the filter train at a flow rate of 8400 cfm \pm 10%.

*Surveillance interval is an exception to the guidance provided in Regulatory Guide 1.52, Revision 2, March 1978.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the fan starts and isolation valves necessary to draw a suction from the refueling area or the reactor enclosure recirculation discharge open on each of the following test signals:
 - a) Manual initiation from the control room, and
 - b) Simulated automatic initiation signal.
3. Verifying that the temperature differential across each heater is $\geq 15^{\circ}\text{F}$ when tested in accordance with ANSI N510-1980.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter bank satisfies the inplace penetration and leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 while operating the system at a flow rate of 5764 cfm \pm 10%.
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorber bank satisfies the inplace penetration and leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of 5764 cfm \pm 10%.
- g. After any major system alteration:
 1. Verify that when the SGTS fan is running the subsystem flowrate is 2800 cfm minimum from each reactor enclosure (Zones I and II) and 2200 cfm minimum from the refueling area (Zone III).
 2. Verify that one standby gas treatment subsystem will drawdown reactor enclosure Zone I secondary containment to greater than or equal to 0.25 inch of vacuum water gauge in less than or equal to 916 seconds with the reactor enclosure recirculation system in operation and the adjacent reactor enclosure and refueling area zones are in their isolation modes.

CONTAINMENT SYSTEMS

BASES

3/4.6.5 SECONDARY CONTAINMENT

Secondary containment is designed to minimize any ground level release of radioactive material which may result from an accident. The Reactor Enclosure and associated structures provide secondary containment during normal operation when the drywell is sealed and in service. At other times the drywell may be open and, when required, secondary containment integrity is specified.

Establishing and maintaining a vacuum in the reactor enclosure secondary containment with the standby gas treatment system once per 24 months, along with the surveillance of the doors, hatches, dampers and valves, is adequate to ensure that there are no violations of the integrity of the secondary containment.

The OPERABILITY of the reactor enclosure recirculation system and the standby gas treatment systems ensures that sufficient iodine removal capability will be available in the event of a LOCA or refueling accident (SGTS only). The reduction in containment iodine inventory reduces the resulting SITE BOUNDARY radiation doses associated with containment leakage. The operation of this system and resultant iodine removal capacity are consistent with the assumptions used in the LOCA and refueling accident analyses. Provisions have been made to continuously purge the filter plenums with instrument air when the filters are not in use to prevent buildup of moisture on the adsorbers and the HEPA filters.

Although the safety analyses assumes that the reactor enclosure secondary containment draw down time will take 930 seconds, these surveillance requirements specify a draw down time of 916 seconds. This 14 second difference is due to the diesel generator starting and sequence loading delays which is not part of this surveillance requirement.

The reactor enclosure secondary containment draw down time analyses assumes a starting point of 0.25 inch of vacuum water gauge and worst case SGTS dirty filter flow rate of 2800 cfm. The surveillance requirements satisfy this assumption by starting the drawdown from ambient conditions and connecting the adjacent reactor enclosure and refueling area to the SGTS to split the exhaust flow between the three zones and verifying a minimum flow rate of 2800 cfm from the test zone. This simulates the worst case flow alignment and verifies adequate flow is available to drawdown the test zone within the required time. The Technical Specification Surveillance Requirement 4.6.5.3.b.3 is intended to be a multi-zone air balance verification without isolating any test zone.

The SGTS fans are sized for three zones and therefore, when aligned to a single zone or two zones, will have excess capacity to more quickly drawdown the affected zones. There is no maximum flow limit to individual zones or pairs of zones and the air balance and drawdown time are verified when all three zones are connected to the SGTS.

The three zone air balance verification and drawdown test will be done after any major system alteration, which is any modification which will have an effect on the SGTS flowrate such that the ability of the SGTS to drawdown the reactor enclosure to greater than or equal to 0.25 inch of vacuum water gage in less than or equal to 916 seconds could be affected.

CONTAINMENT SYSTEMS

BASES

3/4.6.5 SECONDARY CONTAINMENT (Continued)

The field tests for bypass leakage across the SGTS charcoal adsorber and HEPA filter banks are performed at a flow rate of $5764 \pm 10\%$ cfm. The laboratory analysis performed on the SGTS carbon samples will be tested at a velocity of 66 fpm based on the system residence time.

The SGTS filter train pressure drop is a function of air flow rate and filter conditions. Surveillance testing is performed using either the SGTS or drywell purge fans to provide operating convenience.

Each reactor enclosure secondary containment zone and refueling area secondary containment zone is tested independently to verify the design leak tightness. A design leak tightness of 2500 cfm or less for each reactor enclosure and 764 cfm or less for the refueling area at a 0.25 inch of vacuum water gage will ensure that containment integrity is maintained at an acceptable level if all zones are connected to the SGTS at the same time.

The Reactor Enclosure Secondary Containment Automatic Isolation Valves and Refueling Area Secondary Containment Automatic Isolation Valves can be found in the UFSAR.

The post-LOCA offsite dose analysis assumes a reactor enclosure secondary containment post-draw down leakage rate of 2500 cfm and certain post-accident X/Q values. While the post-accident X/Q values represent a statistical interpretation of historical meteorological data, the highest ground level wind speed which can be associated with these values is 7 mph (Pasquill-Gifford stability Class G for a ground level release). Therefore, the surveillance requirement assures that the reactor enclosure secondary containment is verified under meteorological conditions consistent with the assumptions utilized in the design basis analysis. Reactor Enclosure Secondary Containment leakage tests that are successfully performed at wind speeds in excess of 7 mph would also satisfy the leak rate surveillance requirements, since it shows compliance with more conservative test conditions.

3/4.6.6 PRIMARY CONTAINMENT ATMOSPHERE CONTROL

The OPERABILITY of the systems required for the detection and control of hydrogen combustible mixtures of hydrogen and oxygen ensures that these systems will be available to maintain the hydrogen concentration within the primary containment below the lower flammability limit during post-LOCA conditions. The primary containment hydrogen recombiner is provided to maintain the oxygen concentration below the lower flammability limit. The combustible gas analyzer is provided to continuously monitor, both during normal operations and post-LOCA, the hydrogen and oxygen concentrations in the primary containment. The primary containment atmospheric mixing system is provided to ensure adequate mixing of the containment atmosphere to prevent localized accumulations of hydrogen and oxygen from exceeding the lower flammability limit. The hydrogen control system is consistent with the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," March 1971.



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. 86
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 September 27, 1996, 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.

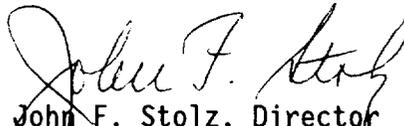
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-85 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 86 , are hereby incorporated in the 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



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: February 11, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 86

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.

<u>Remove</u>	<u>Insert</u>
3/4 6-46	3/4 6-46
3/4 6-53	3/4 6-53
3/4 6-54	3/4 6-54
B 3/4 6-5	B 3/4 6-5
B 3/4 6-6	B 3/4 6-6

CONTAINMENT SYSTEMS

3/4.6.5 SECONDARY CONTAINMENT

REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.5.1.1 REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

Without REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY, restore REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1.1 REACTOR ENCLOSURE SECONDARY CONTAINMENT INTEGRITY shall be demonstrated by:

- a. Verifying at least once per 24 hours that the pressure within the reactor enclosure secondary containment is greater than or equal to 0.25 inch of vacuum water gauge.
- b. Verifying at least once per 31 days that:
 1. All reactor enclosure secondary containment equipment hatches and blowout panels are closed and sealed.
 2. At least one door in each access to the reactor enclosure secondary containment is closed.
 3. All reactor enclosure secondary containment penetrations not capable of being closed by OPERABLE secondary containment automatic isolation dampers/valves and required to be closed during accident conditions are closed by valves, blind flanges, slide gate dampers or deactivated automatic dampers/valves secured in position.
- c. At least once per 24 months:
 1. Verifying that one standby gas treatment subsystem will draw down the reactor enclosure secondary containment to greater than or equal to 0.25 inch of vacuum water gauge in less than or equal to 916 seconds with the reactor enclosure recirc system in operation, and
 2. Operating one standby gas treatment subsystem for one hour and maintaining greater than or equal to 0.25 inch of vacuum water gauge in the reactor enclosure secondary containment at a flow rate not exceeding 2500 cfm with wind speeds of ≤ 7.0 mph as measured on the wind instrument on Tower 1, elevation 30' or, if that instrument is unavailable, Tower 2, elevation 159'.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 24* months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire, or chemical release in any ventilation zone communicating with the subsystem by:
1. Verifying that the subsystem satisfies the in-place penetration and bypass leakage testing acceptance criteria of less than 0.05% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 5764 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 0.175%; and
 3. Verify that when the fan is running the subsystem flowrate is 2800 cfm minimum from each reactor enclosure (Zones I and II) and 2200 cfm minimum from the refueling area (Zone III) when tested in accordance with ANSI N510-1980.
 4. Verify that the pressure drop across the refueling area to SGTS prefilter is less than 0.25 inches water gage while operating at a flow rate of 2400 cfm \pm 10%.
- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, for a methyl iodide penetration of less than 0.175%.
- d. At least once per 24 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 9.1 inches water gauge while operating the filter train at a flow rate of 8400 cfm \pm 10%.

*Surveillance interval is an exception to the guidance provided in Regulatory Guide 1.52, Revision 2, March 1978.

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that the fan starts and isolation valves necessary to draw a suction from the refueling area or the reactor enclosure recirculation discharge open on each of the following test signals:
 - a) Manual initiation from the control room, and
 - b) Simulated automatic initiation signal.
3. Verifying that the temperature differential across each heater is $\geq 15^{\circ}\text{F}$ when tested in accordance with ANSI N510-1980.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter bank satisfies the inplace penetration and leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 while operating the system at a flow rate of 5764 cfm \pm 10%. |
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorber bank satisfies the inplace penetration and leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of 5764 cfm \pm 10%. |
- g. After any major system alteration:
 1. Verify that when the SGTS fan is running the subsystem flowrate is 2800 cfm minimum from each reactor enclosure (Zones I and II) and 2200 cfm minimum from the refueling area (Zone III).
 2. Verify that one standby gas treatment subsystem will drawdown reactor enclosure Zone II secondary containment to greater than or equal to 0.25 inch of vacuum water gauge in less than or equal to 916 seconds with the reactor enclosure recirculation system in operation and the adjacent reactor enclosure and refueling area zones are in their isolation modes. |

CONTAINMENT SYSTEMS

BASES

3/4.6.5 SECONDARY CONTAINMENT

Secondary containment is designed to minimize any ground level release of radioactive material which may result from an accident. The Reactor Enclosure and associated structures provide secondary containment during normal operation when the drywell is sealed and in service. At other times the drywell may be open and, when required, secondary containment integrity is specified.

Establishing and maintaining a vacuum in the reactor enclosure secondary containment with the standby gas treatment system once per 24 months, along with the surveillance of the doors, hatches, dampers and valves, is adequate to ensure that there are no violations of the integrity of the secondary containment.

The OPERABILITY of the reactor enclosure recirculation system and the standby gas treatment systems ensures that sufficient iodine removal capability will be available in the event of a LOCA or refueling accident (SGTS only). The reduction in containment iodine inventory reduces the resulting SITE BOUNDARY radiation doses associated with containment leakage. The operation of this system and resultant iodine removal capacity are consistent with the assumptions used in the LOCA and refueling accident analyses. Provisions have been made to continuously purge the filter plenums with instrument air when the filters are not in use to prevent buildup of moisture on the adsorbers and the HEPA filters.

Although the safety analyses assumes that the reactor enclosure secondary containment draw down time will take 930 seconds, these surveillance requirements specify a draw down time of 916 seconds. This 14 second difference is due to the diesel generator starting and sequence loading delays which is not part of this surveillance requirement.

The reactor enclosure secondary containment draw down time analyses assumes a starting point of 0.25 inch of vacuum water gauge and worst case SGTS dirty filter flow rate of 2800 cfm. The surveillance requirements satisfy this assumption by starting the drawdown from ambient conditions and connecting the adjacent reactor enclosure and refueling area to the SGTS to split the exhaust flow between the three zones and verifying a minimum flow rate of 2800 cfm from the test zone. This simulates the worst case flow alignment and verifies adequate flow is available to drawdown the test zone within the required time. The Technical Specification Surveillance Requirement 4.6.5.3.b.3 is intended to be a multi-zone air balance verification without isolating any test zone.

The SGTS is common to Unit 1 and 2 and consists of two independent subsystems. The power supplies for the common portions of the subsystems are from Unit 1 safeguard busses, therefore the inoperability of these Unit 1 supplies are addressed in the SGTS ACTION statements in order to ensure adequate onsite power sources to SGTS for its Unit 2 function during a loss of offsite power event. The allowable out of service times are consistent with those in the Unit 1 Technical Specifications for SGTS and AC electrical power supply out of service condition combinations.

CONTAINMENT SYSTEMS

BASES

SECONDARY CONTAINMENT (Continued)

The SGTS fans are sized for three zones and therefore, when aligned to a single zone or two zones, will have excess capacity to more quickly drawdown the affected zones. There is no maximum flow limit to individual zones or pairs of zones and the air balance and drawdown time are verified when all three zones are connected to the SGTS.

The three zone air balance verification and drawdown test will be done after any major system alteration, which is any modification which will have an effect on the SGTS flowrate such that the ability of the SGTS to drawdown the reactor enclosure to greater than or equal to 0.25 inch of vacuum water gage in less than or equal to 916 seconds could be affected.

The field tests for bypass leakage across the SGTS charcoal adsorber and HEPA filter banks are performed at a flow rate of $5764 \pm 10\%$ cfm. The laboratory analysis performed on the SGTS carbon samples will be tested at a velocity of 66 fpm based on the system residence time.

The SGTS filter train pressure drop is a function of air flow rate and filter conditions. Surveillance testing is performed using either the SGTS or drywell purge fans to provide operating convenience.

Each reactor enclosure secondary containment zone and refueling area secondary containment zone is tested independently to verify the design leak tightness. A design leak tightness of 2500 cfm or less for each reactor enclosure and 764 cfm or less for the refueling area at a 0.25 inch of vacuum water gage will ensure that containment integrity is maintained at an acceptable level if all zones are connected to the SGTS at the same time.

The Reactor Enclosure Secondary Containment Automatic Isolation Valves and Refueling Area Secondary Containment Automatic Isolation Valves can be found in the UFSAR.

The post-LOCA offsite dose analysis assumes a reactor enclosure secondary containment post-draw down leakage rate of 2500 cfm and certain post-accident X/Q values. While the post-accident X/Q values represent a statistical interpretation of historical meteorological data, the highest ground level wind speed which can be associated with these values is 7 mph (Pasquill-Gifford stability Class G for a ground level release). Therefore, the surveillance requirement assures that the reactor enclosure secondary containment is verified under meteorological conditions consistent with the assumptions utilized in the design basis analysis. Reactor Enclosure Secondary Containment leakage tests that are successfully performed at wind speeds in excess of 7 mph would also satisfy the leak rate surveillance requirements, since it shows compliance with more conservative test conditions.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 122 AND 86 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 September 27, 1996, the Philadelphia Electric Company (the licensee) submitted a request for changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TSs). The requested changes would increase the maximum allowable inleakage rate into the reactor enclosure secondary containment (RESC) to 2500 cfm from 1250 cfm. This change would also result in (1) an increase the RESC pressure drawdown time, and (2) a reduction of air residence time in the Standby Gas Treatment System (SGTS) charcoal adsorber bed.

Specifically, the licensee made these requests:

1. Amend the allowable inleakage rate specified in the TS Section 4.6.5.1.1.c, to 2500 cfm from 1250 cfm and revise TS Bases Section 3/4.6.5 accordingly.
2. Amend the allowable RESC pressure drawdown time specified in the TS Sections 4.6.5.1.1.g and 4.6.5.1.1.c, to 916 seconds (15 minutes and 16 seconds) from 126 seconds (2 minutes and 6 seconds) and revise TS Bases 3/4.6.1.4 accordingly.
3. Change the system Flow rate for charcoal adsorber bypass leakage testing in the TS Sections 4.6.5.1.1.b, 4.6.5.1.1.e, and 4.6.5.1.1.f and in TS Bases Section 3/4 6.5, to 5764 cfm (2500 cfm from each unit plus 764 cfm from common refueling area) from 3264 cfm (1250 cfm from each unit plus 764 cfm from common refueling area).
4. Add a sentence in Bases Section 3/4.6.5, "The laboratory analysis performed on the SGTS charcoal adsorber samplers will be tested at a air flow velocity of 66 feet per minute based on corresponding 5764 cfm flow through the SGTS charcoal adsorber" deleting "This flow rate corresponds to the maximum overall three zone inleakage rate of 3264 cfm."

2.0 EVALUATION

The SGTS is common to both Units 1 and 2 and consists of the two redundant SGTS filter trains and two 100 percent capacity fans. Each fan has a controllable capacity of 500 cfm to 8400 cfm. Air flow varies in response to secondary containment differential pressure controls, which modulate the fan inlet vanes and control dampers in the run-around bypass and discharge ducts provided for each fan. Each filter train consists of, among other things, a vertical 8-inch deep charcoal adsorber bed. The licensee stated in the submittal that it is becoming difficult to maintain the RESC at an inleakage rate of less than 1250 cfm due to normal wear and tear on secondary containment doors, seals, gaskets, and penetrations. Changing the RESC post drawdown maximum inleakage rate to 2500 cfm per unit will not require any modifications to the SGTS or any supporting system.

The staff has reviewed the licensee's analysis and finds that its offsite and control room operator radiological consequence assessments meet the relevant dose acceptance criteria. The staff has performed independent assessments of the offsite and control room operator radiological consequences resulting from a postulated LOCA. The staff used an increased RESC inleakage rate of 2500 cfm and an increased RESC pressure drawdown time of 15 minutes and 30 seconds in its evaluation.

In Amendment No. 106 to the Limerick Unit No. 1 TS and Amendment 53 to the Limerick Unit No. 2 TS dated January 24, 1996, and February 16, 1995, respectively, the staff assessed the offsite and control room radiological consequences of a loss of coolant accident (LOCA) for increased allowable Main Steam Isolation Valve (MSIV) leak rate and deletion of the MSIV leakage control system. In those assessments, the staff considered the following sources and radioactivity transport paths to the environment following a postulated LOCA:

- (1) containment leakage
- (2) main steam isolation valve leakage
- (3) post-LOCA leakage from engineered safety features (ESF) outside containment

In this evaluation for the increased RESC inleakage rate and increased RESC drawdown time, the staff recalculated the offsite and control room radiological consequences resulting only from containment leakage (pathway 1 above) and post-LOCA leakage from ESF outside containment (pathway 3 above) since the dose contribution from MSIV leakage (pathway 2 above) is not affected by increased RESC inleakage and remains the same. The procedures used in the staff's recalculation of offsite and control room radiological consequences were based on (1) the current TID-14844 source term which are consistent with the guidelines provided in the applicable Standard Review Plan (SRP) (NUREG-0800) and Regulatory Guides, and (2) assumptions and parameters used in the previous radiological consequence assessments, except for the increased RESC inleakage rate and the increased RESC pressure draw downtime.

In its analysis, the licensee has taken a deviation to technical position C.3.i in Regulatory Guide 1.52, "Post Accident ESF Atmosphere Cleanup System Air Filtration and Adsorption Units," Revision 2, dated March 1978. The technical position states, among other things, that the charcoal adsorber system should be designed for an average atmosphere residence time of 0.25 seconds per 2 inches of adsorbent bed. This guidance corresponds to a total of 1.0 second for the 8-inch deep adsorber bed in the Limerick SGTS.

Increasing the secondary containment leakage rate to 2500 cfm could result in a 3-zone total leakage rate of 5764 cfm (i.e., 2500 cfm each unit and 764 cfm from the common refueling area). At this leakage rate, the atmosphere residence time in the charcoal adsorber bed is reduced to 0.68 seconds. The current atmosphere residence time for the existing adsorber bed for a 3-zone leakage rate of 3264 cfm (i.e., 1250 cfm from each unit and 764 cfm from the common refueling area) is 1.1 seconds. The proposed residence time of 0.68 seconds represents an air velocity through the charcoal adsorber bed of approximately 66 feet per minute (fpm).

To justify this deviation, the licensee proposed to revise the existing LGS procedures to require the laboratory analysis for carbon samples to be performed at an air velocity of 66 fpm (0.68 atmosphere residence time) to meet surveillance requirements specified in Limerick TS Section 4.6.5.1.1. The corresponding Limerick TS Bases Section 3/4.6.5, "Secondary Containment," will also be revised to state this change. The staff finds the justification provided by the licensee to be acceptable.

The recalculated offsite doses resulting from a postulated LOCA and the parameters and assumptions used in recalculation are given in Tables 1 and 2 of this Safety Evaluation (SE), respectively. The staff finds that recalculated offsite doses still meet the dose guidelines set forth in 10 CFR Part 100. The recalculated control room operator doses following a postulated LOCA, along with the parameters and assumptions used, are listed in the Table 3 of this SE. The staff also finds that the recalculated whole-body and equivalent organ doses (thyroid) are still within the guidelines of Standard Review Plan (SRP) Section 6.4 and therefore, within the acceptance criteria specified in General Design Criterion (GDC) 19 of Appendix A to 10 CFR Part 50.

Based on the above evaluation and the calculated radiological consequences shown in Tables 1 and 3, the staff concludes that the proposed RESC leakage rate of 2500 cfm and RESC pressure drawdown time of 15 minutes and 30 seconds are acceptable.

The staff further concludes that the existing distances to the exclusion area and to the low population zone boundaries of the Limerick Generating Station, in conjunction with the engineered safety features provided in the Limerick Generating Station, are still sufficient to provide reasonable assurance that the radiological consequences of a postulated LOCA will be within the dose guidelines set forth in 10 CFR Part 100 and the control room operator dose acceptance criteria specified in GDC-19 of Appendix A to 10 CFR Part 50. This

conclusion is based on the staff review of the applicant's analysis and on the independent analysis by the staff which confirms that the calculated total doses are within these guidelines.

TABLE 1
Radiological Consequences of Loss-of-Coolant Accident
(rem)

	EAB		LPZ	
	Thyroid	Whole Body	Thyroid	Whole Body
Containment Leakage	19.6	2.7	5.4	1.7
Emergency Core Cooling System (ECCS) Component leakage	29.5	4.3	8.2	1.8
MSIV leakage ⁽¹⁾	17.0	15.8	38.0	6.4
Total	66.1	22.8	51.6	9.9

(1) From Amendment No. 106 to the Limerick Unit No. 1 TS and Amendment 53 to the Limerick Unit No. 2 TS dated January 24, 1996 and February 16, 1995, respectively

TABLE 2
Assumptions Used to Evaluate the Loss-of-Coolant Accident

Parameter	Value
Power level	3527 Mwt
Fraction of core inventory released	
Noble gases	100%
Iodine	50%
Iodine initial plate-out fraction	50%
Iodine chemical species	
Elemental	91%
Particulate	5%
Organic	4%
Suppression pool decontamination factor	
Noble gas	1
Organic iodine	1
Elemental iodine	10
Particulate	10
Iodine dose conversion factors	ICRP-30
Iodine deposition factor (MSIV)	10
MSIV leakrate	200 SCFH
Iodine partition factor for ECCS leak	10
ECCS leak rate	5 gpm
Standby gas treatment system	
Filter efficiency	99%
Flow rate	2500 ft ³ /min)
Drawdown time	930 seconds
Primary containment free volume	4.0E+5 ft ³)
Secondary containment free volume	1.8E+6 ft ³)
Secondary containment mixing efficiency	50 percent
Breathing rates	Regulatory Guide 1.3

TABLE 3
Assumptions and Estimates of the
Radiological Consequences to Control Room
Operators following a LOCA

Control room free volume	1.26E+5 ft ³	
Recirculation Rates		
Filtered Intake	525 CFM	
Unfiltered Intake	0.0	
Filtered Recirculation	2475 CFM	
Filter Efficacy (2 inch charcoal)	95%	
Unfiltered control room infiltration rate (assumed)	50 CFM	
Duration of accident	30 days	
Breathing rate of operators in control room for the course of the accident	3.47 x 10 ⁻⁴ m ³ /sec	
Meteorology (wind speeds for all sectors)		
0 - 8 hours	3.46 x 10 ⁻⁴ sec/m ³	
8 - 24 hours	2.04 x 10 ⁻⁴ sec/m ³	
24 - 96 hours	1.30 x 10 ⁻⁴ sec/m ³	
96 - 720 hours	5.71 x 10 ⁻⁵ sec/m ³	
Iodine protection factor	38.5	
Iodine Dose Conversion Factors*	ICRP-30	
Control Room Operator Occupational Factors		
0 - 8 hours	1	
8 - 24 hours	1	
24 - 96 hours	0.6	
96 - 720 hours	0.4	
Doses to control room operators	Thyroid dose* (rem) 20	Whole body dose** (rem) <1

*unweighted dose equivalent

**unweighted dose equivalent (red bone marrow) due to immersion in an infinite cloud

Based on the foregoing evaluation, the staff finds the proposed changes to the TS, and associated bases, 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 and change the surveillance requirements. 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 (61 FR 64392). 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 Contributors: J. Lee
R. Goel
F. Rinaldi

Date: February 11, 1997