December 7, 1988

Docket No.: 50-352

DISTRIBUTION:

Docket File	ACRS (10)	EButcher
NRC PDR	GPA/PA	BGrimes
Local PDR	OGC	Brent Clayton
PDI-2 Rdg File	RDiggs, ARM/	RGallo
SVarga	LFMB	JMiller,OTSB
BBoger	TMeek (4)	
WButler	EJordan	
RClark	DHagan	
RMartin	Wanda Jones	
MO'Brien	Tech Branch	

Mr. George A. Hunger, Jr.
Director-Licensing
Philadelphia Electric Company
Correspondence Control Desk
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Hunger:

SUBJECT: CHARCOAL ADSORBER COOLDOWN MODE (TAC NO. 69393)

RE: LIMERICK GENERATING STATION, UNIT 1

The Commission has issued the enclosed Amendment No. 12 to Facility Operating License No. NPF-39 for the Limerick Generating Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 7, 1988.

This letter approves modification of the Limerick Unit 1 Reactor Enclosure Recirculation System (RERS) and the common plant Standby Gas Treatment System (SGTS) to remove the cooldown mode of operation for the charcoal beds. Our letter to you of March 19, 1987 had approved a similar modification for Limerick Unit 2. The enclosed amendment revises the TSs to delete reference to the cooldown modes for the RERS and SGTS.

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
Richard J. Clark
Richard J. Clark, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 12 to License No. NPF-39
2. Safety Evaluation

cc w/enclosures:
See next page

*Previously Concurred

PDI-2/LA	PDI-2/PM*	OGC*	PDI-2/D*
MO'Brien*	RClark:mr	SHLewis	WButler
11/22/88	11/08/88	12/02/88	12/06/88

DF01
1/1

~~November 7, 1988~~

Docket No.: 50-352

DISTRIBUTION:

Docket File	ACRS (10)	EButcher
NRC PDR	GPA/PA	BGrimes
Local PDR	OGC	Brent Clayton
PDI-2 Rdg File	RDiggs, ARM/	RGallo
SVarga	LFMB	JMiller,OTSB
BBoger	TMeek (4)	
WButler	EJordan	
RClark	DHagan	
RMartin	Wanda Jones	
MO'Brien	Tech Branch	

Mr. William M. Alden
Director-Licensing
Philadelphia Electric Company
Correspondence Control Desk
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Alden:

SUBJECT: CHARCOAL ADSORBER COOLDOWN MODE (TAC NO. 69393)

RE: LIMERICK GENERATING STATION, UNIT 1

The Commission has issued the enclosed Amendment No. 12 to Facility Operating License No. NPF-39 for the Limerick Generating Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 7, 1988.

This letter approves modification of the Limerick Unit 1 Reactor Enclosure Recirculation System (RERS) and the common plant Standby Gas Treatment System (SGTS) to remove the cooldown mode of operation for the charcoal beds. Our letter to you of March 19, 1987 had approved a similar modification for Limerick Unit 2. The enclosed amendment revises the TSs to delete reference to the cooldown modes for the RERS and SGTS.

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
Richard J. Clark

Richard J. Clark, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 12 to License No. NPF-39
2. Safety Evaluation

cc w/enclosures:
See next page

*Previously Concurred

PDI-2/LA	PDI-2/PM*	OGC	PDI-2/D
MO'Brien	RClark:mf	SHLewis	WButler
12/2/88	11/08/88	12/2/88	12/6/88
	12/06/88		

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: December 7, 1988

*Previously concurred

PDI-2/LA*	PDI-2/PM*	OGC*	PDI-2/D*
MO'Brien	RClark:mr	SHLewis	WButler
11/22/88	11/08/88	12/02/88	12/06/88

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: ~~November 7, 1988~~

PDI-2/LA	PDI-2/PM	OGC	PDI-2/D
MO'Brien	RClark:mf	SHLewis	WButler
11/7/88	11/08/88	12/2/88	12/6/88

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

December 7, 1988

Docket No.: 50-352

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

Dear Mr. Hunger:

SUBJECT: CHARCOAL ADSORBER COOLDOWN MODE (TAC NO. 69393)

RE: LIMERICK GENERATING STATION, UNIT 1

The Commission has issued the enclosed Amendment No. 12 to Facility Operating License No. NPF-39 for the Limerick Generating Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 7, 1988.

This letter approves modification of the Limerick Unit 1 Reactor Enclosure Recirculation System (RERS) and the common plant Standby Gas Treatment System (SGTS) to remove the cooldown mode of operation for the charcoal beds. Our letter to you of March 19, 1987 had approved a similar modification for Limerick Unit 2. The enclosed amendment revises the TSs to delete reference to the cooldown modes for the RERS and SGTS.

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

Sincerely,

Richard J. Clark

Richard J. Clark, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 12 to
License No. NPF-39
2. Safety Evaluation

cc w/enclosures:
See next page

cc:

Troy B. Conner, Jr., Esquire
Conner and Wetterhahn
1747 Pennsylvania Ave., N.W.
Washington, D. C. 20006

Mr. Rod Krich S7-1
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. David Honan N2-1
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. Grahm M. Leitch, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, Pennsylvania 19464

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

Mr. Thomas Kenny
Senior Resident Inspector
US Nuclear Regulatory Commission
P. O. Box 596
Pottstown, Pennsylvania 19464

Mr. Joseph W. Gallagher
Vice President, Nuclear Services
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. John S. Kemper
Senior Vice President-Nuclear
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. Robert Gramm
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 596
Pottstown, Pennsylvania 19464

Mr. Ted Ullrich
Manager - Unit 2 Startup
Limerick Generating Station
P. O. Box A
Sanatoga, Pennsylvania 19464

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

Thomas Gerusky, Director
Bureau of Radiation Protection
PA Dept. of Environmental Resources
P. O. Box 2063
Harrisburg, Pennsylvania 17120

Governor's Office of State
Planning and Development
ATTN: Coordinator, Pennsylvania
State Clearinghouse
P. O. Box 1323
Harrisburg, Pennsylvania 17102

Mr. Philip J. Duca
Superintendent-Technical
Limerick Generating Station
P. O. Box A
Sanatoga, Pennsylvania 19464

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

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 12
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 July 7, 1988, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health 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. 12 , 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.

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: December 7, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 12

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. Overleaf pages are provided to maintain document completeness.*

Remove	Insert
3/4 6-53	3/4 6-53*
3/4 6-54	3/4 6-54
3/4 6-55	3/4 6-55*
3/4 6-56	3/4 6-56

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 18 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 3000 cfm ± 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 ± 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 18 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 ± 10%.

*Specified subsystem flow rate is for a two unit operation. During the Unit 2 construction phase, the Unit 1 subsystem flow rate will be 2800 cfm minimum from the reactor enclosure and 2200 cfm minimum from the refueling area (Zone III).

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°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 3000 cfm ± 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 3000 cfm ± 10%.

g. Prior to initial criticality of Unit 2 or 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 121 seconds with the reactor enclosure recirculation system in operation and the adjacent reactor enclosure and refueling area zones are in their isolation modes.

REACTOR ENCLOSURE RECIRCULATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.5.4 Two independent reactor enclosure recirculation subsystems shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With one reactor enclosure recirculation subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With both reactor enclosure recirculation subsystems inoperable, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.4 Each reactor enclosure recirculation subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the subsystem operates properly.

b. At least once per 18 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 60,000 cfm ± 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 1%; and

3. Verifying a subsystem flow rate of 60,000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1980.

SURVEILLANCE REQUIREMENTS (Continued)

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 1%.

d. At least once per 18 months by:

1. Verifying that the pressure drop across the combined prefilter, upstream and downstream HEPA filters, and charcoal adsorber banks is less than 6 inches water gauge while operating the filter train at a flow rate of 60,000 cfm ± 10%, verifying that the prefilter pressure drop is less than 0.8 inch water gauge and that the pressure drop across each HEPA is less than 2 inches water gauge.

2. Verifying that the filter train starts and the isolation valves which take suction on and return to the reactor enclosure open on each of the following test signals:

a. Manual initiation from the control room, and

b. Simulated automatic initiation signal.

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 60,000 cfm ± 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 60,000 cfm ± 10%.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 12 TO FACILITY OPERATING LICENSE NO. NPF-39

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION, UNIT 1

DOCKET NO. 50-352

1.0 INTRODUCTION

By letter dated July 7, 1988, Philadelphia Electric Company (the licensee) requested an amendment to Facility Operating License No. NPF-39 for the Limerick Generating Station, Unit 1. The proposed amendment would delete reference to the cooldown mode of operation for the Unit 1 Reactor Enclosure Recirculation System (RERS) and the common plant Standby Gas Treatment System (SGTS). The revision will permit a modification to be made to the Limerick Unit 1 RERS and SGTS similar to that which the Commission has previously approved for Limerick Unit 2 (Letter, Robert Bernero, Director, Division of BWR Licensing, NRC to Edward G. Bauer, Vice President and General Counsel, PECo dated March 18, 1987.

2.0 DISCUSSION

The Limerick Unit 1 RERS is an atmosphere cleanup system designed to reduce halogen and particulate concentrations which result from a LOCA by recirculating the Unit 1 Reactor Enclosure air through a series of filters. Unit 1 RERS consists of two redundant filter trains in the reactor enclosure each capable of handling 100% of the RERS fan capacity. Each of the RERS filter trains consists of a bank of prefilters, two banks of HEPA filters (upstream and downstream of the charcoal adsorber), a vertical two-inch deep charcoal adsorber bed and associated instruments. The charcoal adsorber is a gasketless, welded seam type filled with impregnated activated charcoal. The filter bank holds a total of approximately 13,000 pounds of charcoal having an ignition temperature of not less than 626 degrees F. The charcoal adsorber is capable of removing not less than 95.0% of elemental iodine and 95.0% of organic iodine at 70% Relative Humidity (RH).

The SGTS is an atmosphere cleanup system designed to reduce halogen and particulate concentrations potentially present in the reactor enclosure following a LOCA or a postulated fuel handling accident in the refueling area, before the air is discharged to the environment. The system exhausts a controlled amount of filtered air to the atmosphere during the Reactor Enclosure and/or Refueling Area isolation to restore and maintain a negative pressure in the affected secondary containment zone(s). Each of the two 100% redundant SGTS filter trains consists of two banks of HEPA filters (upstream and downstream of charcoal adsorber), a vertical 8-inch

deep charcoal adsorber bed and associated ducts, instruments, valves and controls. Like the RERS, the SGTS charcoal adsorber is a gasketless, welded seam type filled with impregnated activated charcoal. The bank holds a total of approximately 2400 pounds of charcoal having an ignition temperature of not less than 626 degrees F. The charcoal adsorber is capable of removing not less than 99.0% of elemental iodine and 99.0% of organic iodine at 70% RH.

The RERS and SGTS are standby systems which do not routinely operate during normal plant operation. A cooldown mode is included in both the RERS and SGTS system design. This mode enables air to be admitted to each train that is not in operation, to limit excessive charcoal temperature increases due to potential radioactive decay heat buildup in the charcoal adsorbers after shutdown of the train. The cooldown mode is designed to prevent 1) auto-ignition of the charcoal and 2) potential iodine desorption.

The SGTS and the RERS cooldown modes are designed to be operated in the same way and serve the same purpose. The design of each filter train includes a temperature sensor and three different temperature alarms which annunciate in the Main Control Room at 200 degrees F, 250 degrees F, and 550 degrees F for the charcoal adsorber. The fire protection provided for the RERS and SGTS is a water flooding system. In the event of postulated charcoal heat up, the first high temperature alarm will sound in the control room. The operator may turn the SGTS or RERS system to the cooldown mode, which lets the air recirculate through the charcoal adsorbers to cool down the charcoal. If the charcoal continues to heat up, the second and/or the third high temperature alarms will sound. The cooldown mode is stopped and the charcoal adsorber's fire protection systems will be manually initiated to cool down the charcoal.

The proposed deletion of the cooldown modes will not affect the existing temperature alarms or fire protection systems. It should be noted that the separate water deluge system, which is provided within the charcoal adsorbers for fire protection, is not affected by this modification.

3.0 EVALUATION

The licensee performed a safety evaluation to quantitatively assess the effect of removal of the cooldown mode from the RERS and SGTS. The safety evaluation, which determined the maximum temperature increase in the charcoal beds due to radioiodine decay heat buildup, is similar to the safety evaluation performed to support deletion of the Limerick Unit 2 RERS cooldown mode. The calculation models are discussed below along with the results and conclusion of the licensee's and our assessment. Using accepted codes and certain assumptions, the licensee calculated that the maximum temperature rise due to radioactive decay heat buildup following a design basis loss of coolant accident (LOCA) would be 3.2°F in the RERS charcoal beds and 22.7°F in the SGTS charcoal. The staff considers the LOCA to be the bounding case.

With respect to the RERS, for the bounding case, which assumes no flow through the RERS filters and 150°F reactor enclosure air, the licensee calculated the maximum cumulative post-LOCA RERS charcoal bed temperature to be 153.2°F. With respect to the SGTS, for the bounding case, which assumes no flow through the SGTS filters, zero percent efficient RERS filters and 150°F reactor enclosure air, the maximum cumulative post-LOCA SGTS charcoal bed temperature was 172.7°F. Both of these maximum temperatures are significantly less than the 626°F charcoal auto-ignition temperature and the 300°F iodine desorption temperature referenced in ANSI N509-1980.

We have reviewed the following licensee assumptions which were used in the bounding case analyses to calculate the maximum postulated temperature rise:

(1) 25% of the core iodine inventory is immediately available for leakage from the primary reactor containment. This is consistent with the Regulatory Position in Regulatory Guide 1.3.

(2) 50% of the core iodine inventory is in the suppression pool water. This is consistent with the Regulatory Position in Regulatory Guide 1.7.

(3) The primary containment atmosphere leaks to the reactor building at a rate of 0.5 percent per day, with additional steam leakage of 11.5 standard cubic feet per hour through each main steam isolation valve. Five gpm of suppression pool water is also assumed to be leaking into the Reactor Building through equipment leakage. These assumed values are consistent with those used in recently licensed BWR technical specifications.

(4) An air mixing efficiency of 50 percent within the secondary containment. This assumption is consistent with the acceptance criteria in SRP Section 6.5.3.

(5) A decontamination factor of 10 was used for iodine which becomes airborne after partitioning from the suppression pool water leakage. This assumption is consistent with the assumption used in NUREG-016.

(6) A secondary containment post-LOCA environmental temperature of 150°F. The staff's Regulatory Position is 180°F, as delineated in Regulatory Guide 1.52.

(7) A 100 percent removal efficiency for radioactive iodines by the charcoal adsorber. The staff considers this conservative for purposes of decay heat calculations.

(8) A 100 percent of the iodine beta energies and 50 percent of gamma energies for each isotope are absorbed in the charcoal. The staff considers this assumption conservative.

(9) No iodine removal mechanism other than the charcoal adsorption. The staff considers this assumption conservative.

(10) No unfiltered leakage to the environment during the initial system 2 minute 15 second drawdown time of the RERS after an accident. The staff considers this assumption conservative.

(11) No decay heat load from noble gases. Because of the transient time for such isotopes, the staff finds this assumption acceptable.

(12) The maximum heat load due to the heat of iodine oxidation is approximately 42 watts (3 percent of the decay heat load). The staff finds this assumption acceptable.

(13) A 1,520 ft^2 area (filter front surface area) for natural convective heat loss from the RERS. The staff finds this assumption acceptable.

(14) The surface area for radiative heat transfer from the RERS was taken as the outside steel surface area (820 ft^2). The staff finds this assumption acceptable.

(15) An assumption that the RERS filters are not operational with zero percent efficiency to prefilter air to the SGTS. The staff considers this assumption as being very conservative.

(16) The minimum charcoal ignition temperature of 627°F. The staff's regulatory position in Regulatory Guide 1.52 stipulates that the minimum charcoal ignition temperature is 627°F (330°C) at a 100 feet per minute air flow rate through the adsorber. With the adsorber isolated (no air flow), the staff estimates that the minimum charcoal ignition temperature could be as low as 450°F in a 2 inch adsorber bed.

Using the above assumptions, the licensee has calculated a cumulative charcoal temperature of 153.2°F and 172.7°F for the RERS and SGTS, respectively, at the time of maximum iodine loading during and following an accident. The staff has reviewed the licensee's assumptions and, with two exceptions, finds them to be acceptable. Our acceptance is based on either (1) conformance with applicable Regulatory Guides and other staff guidance, or (2) sufficient conservatism to account for uncertainties in the analysis. The two exceptions are with respect to the licensee's assumptions regarding the secondary containment post-LOCA environment temperature (150°F) and the minimum charcoal ignition temperature (627°F). Using a 180°F secondary containment post LOCA environment temperature, the staff estimates that the charcoal temperature may reach up to 250°F to 270°F with gradual radioactive iodine loading into the charcoal adsorber during and following an accident. Also, the charcoal ignition temperature may be as low as 450°F with no air flow through the 2 inch thick adsorber. In view of these considerations, the staff concludes that the maximum expected charcoal temperature rise in the adsorber still will be well below the minimum charcoal ignition temperature.

On the basis of the above evaluation, the staff concludes that the licensee's request to delete the cooldown air flow paths to the charcoal adsorbers is acceptable. The bases for acceptance are that (1) the expected maximum charcoal temperature rise in the adsorber due to potential radioactive decay heat buildup during and following an accident is well below the minimum charcoal ignition temperature, and (2) a separate water deluge system within each adsorber is provided with temperature alarm set points. Hence, the requested changes do not affect significantly the risk of a charcoal fire following an accident, and the safety function of the filters will be preserved.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets 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 this amendment.

5.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (53 FR 44254) on November 2, 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 this amendment will not be inimical to the common defense and the security nor to the health and safety of the public.

Principal Contributor: Dick Clark

Dated: December 7, 1988