

January 28, 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. M95809 AND M95810)

Dear Mr. Hunger:

The Commission has issued the enclosed Amendment No. 119 to Facility Operating License No. NPF-39 and Amendment No. 82 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 May 20, 1996.

These amendments revise TS Sections 3/4.4.9.2, 3/4.9.11.1, 3/4.9.11.2, and the associated TS Bases 3/4.4.9 and 3/4.9.11, to more clearly describe that the Residual Heat Removal (RHR) system Shutdown Cooling mode of operation consists of four "subsystems." These TS sections pertain to plant operations during Operational Conditions (OPCONs) 4, "Cold Shutdown" and 5, "Refueling." In addition, the proposed TS change would make administrative changes to TS Section 3/4.4.9.1 to ensure consistency in terminology regarding the description of Shutdown Cooling "subsystems."

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

Docket Nos. 50-352/353

- Enclosures: 1. Amendment No. 119 to License No. NPF-39
- 2. Amendment No. 82 to License No. NPF-85
- 3. Safety Evaluation

cc w/encls: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

January 28, 1997

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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 that reads "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

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Mr. George A. Hunger,  
PECO Energy Company

Limerick Generating Station,  
Units 1 & 2

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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. 119  
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 May 20, 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. 119 , 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: January 28, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 119

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 4-25	3/4 4-25
3/4 4-26	3/4 4-26
3/4 9-17	3/4 9-17
3/4 9-18	3/4 9-18
B 3/4 4-6	B 3/4 4-6
-	B 3/4 4-6a
B 3/4 9-2	B 3/4 9-2
-	B 3/4 9-2a

REACTOR COOLANT SYSTEM

3/4.4.9 RESIDUAL HEAT REMOVAL

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.9.1 Two (2) independent RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one (1) RHR shutdown cooling subsystem shall be in operation. \* \*\* \*\*\*

Each independent RHR shutdown cooling subsystem shall consist of at least:

- a. One OPERABLE RHR pump, and
- b. One OPERABLE RHR heat exchanger, not common to the two (2) independent subsystems.

APPLICABILITY: OPERATIONAL CONDITION 3, with reactor vessel pressure less than the RHR cut-in permissive setpoint.

ACTION:

- a. With less than the above required independent RHR shutdown cooling subsystems OPERABLE, immediately initiate corrective action to return the required independent subsystems to OPERABLE status as soon as possible. Within 1 hour and at least once per 24 hours thereafter, verify the availability of at least one alternate method capable of decay heat removal for each inoperable independent RHR shutdown cooling subsystem. Be in at least COLD SHUTDOWN within 24 hours.\*\*\*\*
- b. With no independent RHR shutdown cooling subsystem in operation, immediately initiate corrective action to return at least one (1) independent subsystem to operation as soon as possible. Within 1 hour establish reactor coolant circulation by an alternate method and monitor reactor coolant temperature and pressure at least once per hour.

SURVEILLANCE REQUIREMENTS

4.4.9.1 At least one independent RHR shutdown cooling subsystem or alternate method shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

\*One independent RHR shutdown cooling subsystem may be inoperable for up to 2 hours for surveillance testing provided the other independent subsystem is OPERABLE and in operation.

\*\*The shutdown cooling pump may be removed from operation for up to 2 hours per 8-hour period provided the other independent subsystem is OPERABLE.

\*\*\*The independent RHR shutdown cooling subsystem may be removed from operation during hydrostatic testing.

\*\*\*\*Whenever two or more RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

## REACTOR COOLANT SYSTEM

### COLD SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

---

3.4.9.2 Two (2) RHR shutdown cooling subsystems shall be OPERABLE, and with no recirculation pump in operation, at least one (1) RHR shutdown cooling subsystem shall be in operation. \* \*\* \*\*\*

APPLICABILITY: OPERATIONAL CONDITION 4.

ACTION: #

- a. With one (1) or two (2) RHR shutdown cooling subsystems inoperable:
  1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem.
- b. With no RHR shutdown cooling subsystems in operation and no recirculation pump in operation:
  1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulating by an alternate method; and
  2. Once per hour monitor reactor coolant temperature and pressure.

#### SURVEILLANCE REQUIREMENTS

---

4.4.9.2 At least one (1) RHR shutdown cooling subsystem or recirculation pump is operating or an alternate method shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

- \* Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to two (2) hours per eight (8) hour period.
- \*\* One (1) RHR shutdown cooling subsystem may be inoperable for up to two (2) hours for the performance of Surveillances.
- \*\*\* The shutdown cooling subsystem may be removed from operation during hydrostatic testing.
- # Separate Action entry is allowed for each shutdown cooling subsystem.

## REFUELING OPERATIONS

### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

#### HIGH WATER LEVEL

#### LIMITING CONDITION FOR OPERATION

---

3.9.11.1 One (1) RHR shutdown cooling subsystem shall be OPERABLE and in operation. \*

APPLICABILITY: OPERATIONAL CONDITION 5, when irradiated fuel is in the reactor vessel and the water level is greater than or equal to 22 feet above the top of the reactor pressure vessel flange.

#### ACTION:

- a. With the required RHR shutdown cooling subsystem inoperable:
  1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available.
- b. With the required action and associated completion time of Action "a" above not met.
  1. Immediately suspend loading of irradiated fuel assemblies into the reactor pressure vessel; and
  2. Immediately initiate action to restore REFUELING FLOOR SECONDARY CONTAINMENT INTEGRITY to OPERABLE status; and
  3. Immediately initiate action to restore one (1) Standby Gas Treatment subsystem to OPERABLE status; and
  4. Immediately initiate action to restore isolation capability in each required Refueling Floor secondary containment penetration flow path not isolated.
- c. With no RHR shutdown cooling subsystem in operation:
  1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulation by an alternate method; and
  2. Once per hour monitor reactor coolant temperature.

#### SURVEILLANCE REQUIREMENTS

---

4.9.11.1 At least one (1) RHR shutdown cooling subsystem, or an alternate method, shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

---

\* The required RHR shutdown cooling subsystem may be removed from operation for up to two (2) hours per eight (8) hour period.

## REFUELING OPERATIONS

### LOW WATER LEVEL

#### LIMITING CONDITION FOR OPERATION

---

3.9.11.2 Two (2) RHR shutdown cooling subsystems shall be OPERABLE, and one (1) RHR shutdown cooling subsystem shall be in operation. \*

APPLICABILITY: OPERATIONAL CONDITION 5, when irradiated fuel is in the reactor vessel and the water level is less than 22 feet above the top of the reactor pressure vessel flange.

#### ACTION:

- a. With one (1) or two (2) required RHR shutdown cooling subsystems inoperable:
  1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available for each inoperable required RHR shutdown cooling subsystem.
- b. With the required action and associated completion time of Action "a" above not met:
  1. Immediately initiate action to restore REFUELING FLOOR SECONDARY CONTAINMENT INTEGRITY to OPERABLE status; and
  2. Immediately initiate action to restore one (1) Standby Gas Treatment subsystem to OPERABLE status; and
  3. Immediately initiate action to restore isolation capability in each required Refueling Floor secondary containment penetration flow path not isolated.
- c. With no RHR shutdown cooling subsystem in operation:
  1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulation by an alternate method; and
  2. Once per hour monitor reactor coolant temperature.

#### SURVEILLANCE REQUIREMENTS

---

4.9.11.2 At least one (1) RHR shutdown cooling subsystem, or an alternate method, shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

---

\* The required operating shutdown cooling subsystem may be removed from operation for up to two (2) hours per eight (8) hour period.

## REACTOR COOLANT SYSTEM

### BASES

#### 3/4.4.7 MAIN STEAM LINE ISOLATION VALVES

Double isolation valves are provided on each of the main steam lines to minimize the potential leakage paths from the containment in case of a line break. Only one valve in each line is required to maintain the integrity of the containment, however, single failure considerations require that two valves be OPERABLE. The surveillance requirements are based on the operating history of this type valve. The maximum closure time has been selected to contain fission products and to ensure the core is not uncovered following line breaks. The minimum closure time is consistent with the assumptions in the safety analyses to prevent pressure surges.

#### 3/4.4.8 STRUCTURAL INTEGRITY

The inspection programs for ASME Code Class 1, 2, and 3 components ensure that the structural integrity of these components will be maintained at an acceptable level throughout the life of the plant.

Components of the reactor coolant system were designed to provide access to permit inservice inspections in accordance with Section XI of the ASME Boiler and Pressure Vessel Code 1971 Edition and Addenda through Winter 1972.

The inservice inspection program for ASME Code Class 1, 2, and 3 components will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). Additionally, the Inservice Inspection Program conforms to the NRC staff positions identified in NRC Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," as approved in NRC Safety Evaluations dated March 6, 1990 and October 22, 1990.

#### 3/4.4.9 RESIDUAL HEAT REMOVAL

The RHR system is required to remove decay heat and sensible heat in order to maintain the temperature of the reactor coolant. RHR shutdown cooling is comprised of four (4) subsystems which make two (2) loops. Each loop consists of two (2) motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Two (2) redundant, manually controlled shutdown cooling subsystems of the RHR System can provide the required decay heat removal capability. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop or to the reactor via the low pressure coolant injection pathway. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled.

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. In HOT SHUTDOWN condition, the requirement to maintain OPERABLE two (2) independent RHR shutdown cooling subsystems means that each subsystem considered OPERABLE must be associated with a different heat exchanger loop, i.e., the "A" RHR heat exchanger with the "A" RHR pump or the "C" RHR pump, and the "B" RHR heat exchanger with the "B" RHR pump or the "D" RHR pump are two (2) independent RHR shutdown cooling subsystems. Only one (1) of the the two (2) RHR pumps associated with each RHR heat exchanger loop is

#### 3/4.4.9 RESIDUAL HEAT REMOVAL (Cont'd)

required to be OPERABLE for that independent subsystem to be OPERABLE. During COLD SHUTDOWN and REFUELING conditions, however, the subsystems not only have a common suction source, but are allowed to have a common heat exchanger and common discharge piping. To meet the LCO of two (2) OPERABLE subsystems, both pumps in one (1) loop or one (1) pump in each of the two (2) loops must be OPERABLE. Since the piping and heat exchangers are passive components, that are assumed not to fail, they are allowed to be common to both subsystems. Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one (1) subsystem can maintain and reduce the reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required.

Alternate decay heat removal methods are available to operators. These alternate methods of decay heat removal can be verified available either by calculation (which includes a review of component and system availability to verify that an alternate decay heat removal method is available) or by demonstration, and that a method of coolant mixing be operational. Decay heat removal capability by ambient losses can be considered in evaluating alternate decay heat removal capability.

## REFUELING OPERATIONS

### BASES

#### 3.4.9.6 REFUELING PLATFORM

The OPERABILITY requirements ensure that (1) the refueling platform will be used for handling control rods and fuel assemblies within the reactor pressure vessel, (2) each hoist has sufficient load capacity for handling fuel assemblies and control rods, (3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations, and (4) inadvertent criticality will not occur due to fuel being loaded into a unrodded cell.

#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE POOL

The restriction on movement of loads in excess of the nominal weight of a fuel assembly and associated lifting device over other fuel assemblies in the storage pool ensures that in the event this load is dropped 1) the activity release will be limited to that contained in a single fuel assembly, and 2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses.

#### 3/4.9.8 and 3/4.9.9 WATER LEVEL - REACTOR VESSEL and WATER LEVEL - SPENT FUEL STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. This minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.10 CONTROL ROD REMOVAL

These specifications ensure that maintenance or repair of control rods or control rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirements for simultaneous removal of more than one control rod are more stringent since the SHUTDOWN MARGIN specification provides for the core to remain subcritical with only one control rod fully withdrawn.

#### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products and increases the temperature of the reactor coolant. This decay heat must be removed by the RHR system to maintain adequate reactor coolant temperature.

RHR shutdown cooling is comprised of four (4) subsystems which make two (2) loops. Each loop consists of two (2) motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Two (2) redundant, manually controlled shutdown cooling subsystems of the RHR system provide decay heat removal. Each pump discharges the reactor coolant, after circulation through the respective heat exchanger, to the reactor via the associated recirculation loop. The RHR heat exchangers transfer heat to the RHR Service Water System.

An OPERABLE RHR shutdown cooling subsystem consists of one (1) OPERABLE RHR pump, one (1) heat exchanger, and the associated piping and valves. The requirement for

### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION (Cont'd)

having one (1) RHR shutdown cooling subsystem OPERABLE ensures that 1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F, and 2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication and to distribute and prevent stratification of the poison in the event it becomes necessary to actuate the standby liquid control system.

The requirement to have two (2) RHR shutdown cooling subsystems OPERABLE when there is less than 22 feet of water above the reactor vessel flange ensures that a single failure of the operating loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 22 feet of water above the reactor vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR subsystem, adequate time is provided to initiate alternate methods capable of decay heat removal or emergency procedures to cool the core.

To meet the LCO of the two (2) subsystems OPERABLE when there is less than 22 feet of water above the reactor vessel flange, both pumps in one (1) loop or one (1) pump in each of the two (2) loops must be OPERABLE. The two (2) subsystems have a common suction source and are allowed to have a common heat exchanger and common discharge piping. Additionally, each shutdown cooling subsystem can provide the required decay heat removal capability; however, ensuring operability of the other shutdown cooling subsystem provides redundancy.

The required cooling capacity of an alternate method of decay heat removal should be ensured by verifying its capability to maintain or reduce reactor coolant temperature either by calculation (which includes a review of component and system availability to verify that an alternate decay heat removal method is available) or by demonstration. Decay heat removal capability by ambient losses can be considered in evaluating alternate decay heat removal capability.

With the required decay heat removal subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Action "a", additional actions are required to minimize any potential fission product release to the environment. This includes ensuring Refueling Floor Secondary Containment is OPERABLE; one (1) Standby Gas Treatment subsystem is OPERABLE; and Secondary Containment isolation capability (i.e., one (1) Secondary Containment isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls to assure isolation capability) in each associated penetration not isolated that is assumed to be isolated to mitigate radioactive releases. This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

If no RHR subsystem is in operation, an alternate method of coolant circulation is required to be established within one (1) hour. The Completion Time is modified such that one (1) hour is applicable separately for each occurrence involving a loss of coolant circulation.



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. 82  
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 May 20, 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.

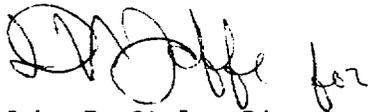
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-85 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 82, 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: January 28, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 82

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 4-25	3/4 4-25
3/4 4-26	3/4 4-26
3/4 9-17	3/4 9-17
3/4 9-18	3/4 9-18
B 3/4 4-6	B 3/4 4-6
-	B 3/4 4-6a
B 3/4 9-2	B 3/4 9-2
-	B 3/4 9-2a

## REACTOR COOLANT SYSTEM

### 3/4.4.9 RESIDUAL HEAT REMOVAL

#### HOT SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

---

3.4.9.1 Two (2) independent RHR shutdown cooling subsystems shall be OPERABLE, and, with no recirculation pump in operation, at least one (1) RHR shutdown cooling subsystem shall be in operation. \* \*\* \*\*\*

Each independent RHR shutdown cooling subsystem shall consist of at least:

- a. One OPERABLE RHR pump, and
- b. One OPERABLE RHR heat exchanger, not common to the two (2) independent subsystems.

APPLICABILITY: OPERATIONAL CONDITION 3, with reactor vessel pressure less than the RHR cut-in permissive setpoint.

#### ACTION:

- a. With less than the above required independent RHR shutdown cooling subsystems OPERABLE, immediately initiate corrective action to return the required independent subsystems to OPERABLE status as soon as possible. Within 1 hour and at least once per 24 hours thereafter, verify the availability of at least one alternate method capable of decay heat removal for each inoperable independent RHR shutdown cooling subsystem. Be in at least COLD SHUTDOWN within 24 hours.\*\*\*\*
- b. With no independent RHR shutdown cooling subsystem in operation, immediately initiate corrective action to return at least one (1) independent subsystem to operation as soon as possible. Within 1 hour establish reactor coolant circulation by an alternate method and monitor reactor coolant temperature and pressure at least once per hour.

#### SURVEILLANCE REQUIREMENTS

---

4.4.9.1 At least one independent RHR shutdown cooling subsystem or alternate method shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

\*One independent RHR shutdown cooling subsystem may be inoperable for up to 2 hours for surveillance testing provided the other independent subsystem is OPERABLE and in operation.

\*\*The shutdown cooling pump may be removed from operation for up to 2 hours per 8-hour period provided the other independent subsystem is OPERABLE.

\*\*\*The independent RHR shutdown cooling subsystem may be removed from operation during hydrostatic testing.

\*\*\*\*Whenever two or more RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

REACTOR COOLANT SYSTEM

COLD SHUTDOWN

LIMITING CONDITION FOR OPERATION

---

3.4.9.2 Two (2) RHR shutdown cooling subsystems shall be OPERABLE, and with no recirculation pump in operation, at least one (1) RHR shutdown cooling subsystem shall be in operation. \* \*\* \*\*\*

APPLICABILITY: OPERATIONAL CONDITION 4.

ACTION: #

- a. With one (1) or two (2) RHR shutdown cooling subsystems inoperable:
  - 1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem.
- b. With no RHR shutdown cooling subsystems in operation and no recirculation pump in operation:
  - 1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulating by an alternate method; and
  - 2. Once per hour monitor reactor coolant temperature and pressure.

SURVEILLANCE REQUIREMENTS

---

4.4.9.2 At least one (1) RHR shutdown cooling subsystem or recirculation pump is operating or an alternate method shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

- \* Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to two (2) hours per eight hour (8) period.
- \*\* One (1) RHR shutdown cooling subsystem may be inoperable for up to two (2) hours for the performance of Surveillances.
- \*\*\* The shutdown cooling subsystem may be removed from operation during hydrostatic testing.
- # Separate Action entry is allowed for each shutdown cooling subsystem.

## REFUELING OPERATIONS

### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

#### HIGH WATER LEVEL

#### LIMITING CONDITION FOR OPERATION

---

3.9.11.1 One (1) RHR shutdown cooling subsystem shall be OPERABLE and in operation. \*

APPLICABILITY: OPERATIONAL CONDITION 5, when irradiated fuel is in the reactor vessel and the water level is greater than or equal to 22 feet above the top of the reactor pressure vessel flange.

#### ACTION:

- a. With the required RHR shutdown cooling subsystem inoperable:
  1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available.
- b. With the required action and associated completion time of Action "a" above not met.
  1. Immediately suspend loading of irradiated fuel assemblies into the reactor pressure vessel; and
  2. Immediately initiate action to restore REFUELING FLOOR SECONDARY CONTAINMENT INTEGRITY to OPERABLE status; and
  3. Immediately initiate action to restore one (1) Standby Gas Treatment subsystem to OPERABLE status; and
  4. Immediately initiate action to restore isolation capability in each required Refueling Floor secondary containment penetration flow path not isolated.
- c. With no RHR shutdown cooling subsystem in operation:
  1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulation by an alternate method; and
  2. Once per hour monitor reactor coolant temperature.

#### SURVEILLANCE REQUIREMENTS

---

4.9.11.1 At least one (1) RHR shutdown cooling subsystem, or an alternate method, shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

---

\* The required RHR shutdown cooling subsystem may be removed from operation for up to two (2) hours per eight (8) hour period.

## REFUELING OPERATIONS

### LOW WATER LEVEL

#### LIMITING CONDITION FOR OPERATION

---

3.9.11.2 Two (2) RHR shutdown cooling subsystems shall be OPERABLE, and one (1) RHR shutdown cooling subsystem shall be in operation. \*

APPLICABILITY: OPERATIONAL CONDITION 5, when irradiated fuel is in the reactor vessel and the water level is less than 22 feet above the top of the reactor pressure vessel flange.

#### ACTION:

- a. With one (1) or two (2) required RHR shutdown cooling subsystems inoperable:
  1. Within one (1) hour, and once per 24 hours thereafter, verify an alternate method of decay heat removal is available for each inoperable required RHR shutdown cooling subsystem.
- b. With the required action and associated completion time of Action "a" above not met:
  1. Immediately initiate action to restore REFUELING FLOOR SECONDARY CONTAINMENT INTEGRITY to OPERABLE status; and
  2. Immediately initiate action to restore one (1) Standby Gas Treatment subsystem to OPERABLE status; and
  3. Immediately initiate action to restore isolation capability in each required Refueling Floor secondary containment penetration flow path not isolated.
- c. With no RHR shutdown cooling subsystem in operation:
  1. Within one (1) hour from discovery of no reactor coolant circulation, and once per 12 hours thereafter, verify reactor coolant circulation by an alternate method; and
  2. Once per hour monitor reactor coolant temperature.

#### SURVEILLANCE REQUIREMENTS

---

4.9.11.2 At least one (1) RHR shutdown cooling subsystem, or an alternate method, shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

---

\* The required operating shutdown cooling subsystem may be removed from operation for up to two (2) hours per eight (8) hour period.

BASES

3/4.4.7 MAIN STEAM LINE ISOLATION VALVES

Double isolation valves are provided on each of the main steam lines to minimize the potential leakage paths from the containment in case of a line break. Only one valve in each line is required to maintain the integrity of the containment, however, single failure considerations require that two valves be OPERABLE. The surveillance requirements are based on the operating history of this type valve. The maximum closure time has been selected to contain fission products and to ensure the core is not uncovered following line breaks. The minimum closure time is consistent with the assumptions in the safety analyses to prevent pressure surges.

3/4.4.8 STRUCTURAL INTEGRITY

The inspection programs for ASME Code Class 1, 2, and 3 components ensure that the structural integrity of these components will be maintained at an acceptable level throughout the life of the plant.

Components of the reactor coolant system were designed to provide access to permit inservice inspections in accordance with Section XI of the ASME Boiler and Pressure Vessel Code 1971 Edition and Addenda through Winter 1972.

The inservice inspection program for ASME Code Class 1, 2, and 3 components will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a(g) except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). Additionally, the Inservice Inspection Program conforms to the NRC staff positions identified in NRC Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," as approved in NRC Safety Evaluations dated March 6, 1990 and October 22, 1990.

3/4.4.9 RESIDUAL HEAT REMOVAL

The RHR system is required to remove decay heat and sensible heat in order to maintain the temperature of the reactor coolant. RHR shutdown cooling is comprised of four (4) subsystems which make two (2) loops. Each loop consists of two (2) motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Two (2) redundant, manually controlled shutdown cooling subsystems of the RHR System can provide the required decay heat removal capability. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop or to the reactor via the low pressure coolant injection pathway. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled.

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. In HOT SHUTDOWN condition, the requirement to maintain OPERABLE two (2) independent RHR shutdown cooling subsystems means that each subsystem considered OPERABLE must be associated with a different heat exchanger loop, i.e., the "A" RHR heat exchanger with the "A" RHR pump or the "C" RHR pump, and the "B" RHR heat exchanger with the "B" RHR pump or the "D" RHR pump are two (2) independent RHR shutdown cooling subsystems. Only one (1) of the two (2) RHR pumps associated with each RHR heat exchanger loop is

### 3/4.4.9 RESIDUAL HEAT REMOVAL (Cont'd)

required to be OPERABLE for that independent subsystem to be OPERABLE. During COLD SHUTDOWN and REFUELING conditions, however, the subsystems not only have a common suction source, but are allowed to have a common heat exchanger and common discharge piping. To meet the LCO of two (2) OPERABLE subsystems, both pumps in one (1) loop or one (1) pump in each of the two (2) loops must be OPERABLE. Since the piping and heat exchangers are passive components, that are assumed not to fail, they are allowed to be common to both subsystems. Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one (1) subsystem can maintain and reduce the reactor coolant temperature as required. However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required.

Alternate decay heat removal methods are available to operators. These alternate methods of decay heat removal can be verified available either by calculation (which includes a review of component and system availability to verify that an alternate decay heat removal method is available) or by demonstration, and that a method of coolant mixing be operational. Decay heat removal capability by ambient losses can be considered in evaluating alternate decay heat removal capability.

## REFUELING OPERATIONS

### BASES

#### 3.4.9.6 REFUELING PLATFORM

The OPERABILITY requirements ensure that (1) the refueling platform will be used for handling control rods and fuel assemblies within the reactor pressure vessel, (2) each hoist has sufficient load capacity for handling fuel assemblies and control rods, (3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations, and (4) inadvertent criticality will not occur due to fuel being loaded into a unrodded cell.

#### 3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE POOL

The restriction on movement of loads in excess of the nominal weight of a fuel assembly and associated lifting device over other fuel assemblies in the storage pool ensures that in the event this load is dropped 1) the activity release will be limited to that contained in a single fuel assembly, and 2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses.

#### 3/4.9.8 and 3/4.9.9 WATER LEVEL - REACTOR VESSEL and WATER LEVEL - SPENT FUEL STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. This minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.10 CONTROL ROD REMOVAL

These specifications ensure that maintenance or repair of control rods or control rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirements for simultaneous removal of more than one control rod are more stringent since the SHUTDOWN MARGIN specification provides for the core to remain subcritical with only one control rod fully withdrawn.

#### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products and increases the temperature of the reactor coolant. This decay heat must be removed by the RHR system to maintain adequate reactor coolant temperature.

RHR shutdown cooling is comprised of four (4) subsystems which make two (2) loops. Each loop consists of two (2) motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Two (2) redundant, manually controlled shutdown cooling subsystems of the RHR system provide decay heat removal. Each pump discharges the reactor coolant, after circulation through the respective heat exchanger, to the reactor via the associated recirculation loop. The RHR heat exchangers transfer heat to the RHR Service Water System.

An OPERABLE RHR shutdown cooling subsystem consists of one (1) OPERABLE RHR pump, one (1) heat exchanger, and the associated piping and valves. The requirement for

having one (1) RHR shutdown cooling subsystem OPERABLE ensures that 1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F, and 2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication and to distribute and prevent stratification of the poison in the event it becomes necessary to actuate the standby liquid control system.

The requirement to have two (2) RHR shutdown cooling subsystems OPERABLE when there is less than 22 feet of water above the reactor vessel flange ensures that a single failure of the operating loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 22 feet of water above the reactor vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR subsystem, adequate time is provided to initiate alternate methods capable of decay heat removal or emergency procedures to cool the core.

To meet the LCO of the two (2) subsystems OPERABLE when there is less than 22 feet of water above the reactor vessel flange, both pumps in one (1) loop or one (1) pump in each of the two (2) loops must be OPERABLE. The two (2) subsystems have a common suction source and are allowed to have a common heat exchanger and common discharge piping. Additionally, each shutdown cooling subsystem can provide the required decay heat removal capability; however, ensuring operability of the other shutdown cooling subsystem provides redundancy.

The required cooling capacity of an alternate method of decay heat removal should be ensured by verifying its capability to maintain or reduce reactor coolant temperature either by calculation (which includes a review of component and system availability to verify that an alternate decay heat removal method is available) or by demonstration. Decay heat removal capability by ambient losses can be considered in evaluating alternate decay heat removal capability.

With the required decay heat removal subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Action "a", additional actions are required to minimize any potential fission product release to the environment. This includes ensuring Refueling Floor Secondary Containment is OPERABLE; one (1) Standby Gas Treatment subsystem is OPERABLE; and Secondary Containment isolation capability (i.e., one (1) Secondary Containment isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls to assure isolation capability) in each associated penetration not isolated that is assumed to be isolated to mitigate radioactive releases. This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

If no RHR subsystem is in operation, an alternate method of coolant circulation is required to be established within one (1) hour. The Completion Time is modified such that one (1) hour is applicable separately for each occurrence involving a loss of coolant circulation.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 119 AND 82 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 May 20, 1996, the Philadelphia Electric Company (the licensee) submitted a request for changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS). The requested changes would revise TS Sections 3/4.4.9.2, 3/4.9.11.1, 3/4.9.11.2, and the associated TS Bases 3/4.4.9 and 3/4.9.11, to more clearly describe that the Residual Heat Removal (RHR) system Shutdown Cooling mode of operation consists of four (4) "subsystems." These TS sections pertain to plant operations during Operational Conditions (OPCONs) 4, "Cold Shutdown" and 5, "Refueling." In addition, the proposed TS change would make administrative changes to TS Section 3/4.4.9.1 to ensure consistency in terminology regarding the description of Shutdown Cooling "subsystems." The proposed TS changes are consistent with the guidance delineated in the Improved TS (i.e., NUREG-1433, Revision 1, "Standard Technical Specifications General Electric Plants, BWR/4," dated April 1995) which indicates that the RHR Shutdown Cooling mode of operation is comprised of two loops and four subsystems (i.e., two subsystems per loop).

2.0 EVALUATION

The licensee has requested approval of this TS change to clarify the RHR system configuration associated with the Shutdown Cooling mode of operation in OPCONs 4 and 5. The licensee has stated that these changes follow the guidance in NUREG-1433, Revision 1, as it relates to Shutdown Cooling operations in OPCONs 4 and 5.

The RHR system at LGS is comprised of a complement of pumps, heat exchangers, valves, piping and supporting equipment. The RHR is designed to serve a number of functions (or modes), including shutdown cooling; low pressure coolant injection, suppression pool cooling and containment spray. The functional design takes into consideration specific plant conditions. Each function and plant condition require a different subset of the total complement of RHR system components in order to demonstrate that the design function is achieved. The RHR system at LGS contains, among other components, two heat exchangers, designated "A" and "B." The RHR system also contains

four pumps, designated "A," "B," "C" and "D". The pumps and heat exchangers are piped such that the "A" and "C" pump provide water through the "A" heat exchanger. Similarly, the "B" and "D" pumps provide water through the "B" heat exchanger.

Component operability and surveillance requirements for certain of the functions of the RHR system and the associated plant conditions are controlled in the TSs. The licensee has proposed changes to the TSs that govern the Shutdown Cooling mode of the RHR system. Limiting Conditions for Operations (LCOs), Applicability and Action statements, and Surveillance requirements for the Shutdown Cooling mode of the RHR system are specified in the following TSs:

FUNCTION	TS
(1) Reactor coolant residual heat removal during Hot Shutdown	3/4.4.9.1
(2) Reactor coolant residual heat removal during Cold Shutdown	3/4.4.9.2
(3) Residual heat removal and coolant circulation with water level greater than 22 feet	3/4.9.11.1
(4) Residual heat removal and coolant circulation with water level less than 22 feet.	3/4.9.11.2

The proposed changes introduce the concept of "subsystems" in a manner consistent with guidance specified in NUREG-1433, Revision 1. Specifically, the four RHR Shutdown Cooling "subsystems" include:

**"A" Loop Subsystems**

- "A" Heat Exchanger and "A" RHR Pump
- "A" Heat Exchanger and "C" RHR Pump

**"B" Loop Subsystems**

- "B" Heat Exchanger and "B" RHR Pump
- "B" Heat Exchanger and "D" RHR Pump

Further, the TS requirements for other operating conditions are not changed by this proposed TS change, and the changes to TS Section 3/4.4.9.1 are only administrative changes that assure consistent terminology.

As described in the Updated Final Safety Analysis Report (UFSAR) and the licensee's May 20, 1996 application, the design basis of the Shutdown Cooling mode is to have the capability to remove decay and sensible heat. The UFSAR indicates that the reactor coolant temperature is reduced to 125°F,

approximately 20 hours after shutdown, to permit refueling when the RHR service water (RHRSW) system temperature is less than 85°F. This can be accomplished by using both RHR heat exchangers. As described in the UFSAR, acceptable plant cooldown can also be achieved using a single RHR heat exchanger. In this case, the plant can be cooled down to 212°F in less than approximately 20 hours.

As described in the application, shutdown cooling is not required for accident mitigation. As a consequence, reliance on common passive components is permissible for certain of the plant conditions under which Shutdown Cooling may be employed. Specifically, reliance on common passive heat exchangers is permissible for Operating Condition 4 (Cold Shutdown) and Operating Condition 5 (water level greater than 22 feet) and Operating Condition 5 (water level less than 22 feet). The licensee has proposed revisions to TSs 3/4.4.9.2, 3.4.9.11.1 and 3.4.9.11.2 to make clear that reliance on common passive components is acceptable for meeting the requirements for operable components.

The licensee proposes to make this clarification by implementing component designations consistent with those used in NUREG-1433. The licensee defines combinations of RHR components in terms of RHR Shutdown Cooling subsystems. An RHR Shutdown Cooling subsystem consists of an RHR pump, a heat exchanger, valves piping, instruments and controls to ensure an operable flow path. The proposed revisions to TSs 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2 are described below:

- (1) TS 3/4.4.9.2 is revised to require that 2 RHR Shutdown Cooling subsystems shall be operable, and under plant condition when no recirculation pumps are operating, at least one RHR Shutdown Cooling subsystem shall be in operation in Operating Condition 4. Action and surveillance requirements are also revised to introduce the use of RHR Shutdown Cooling subsystems. The Bases for TS 3/4.4.9.2 is revised to reflect reliance on common heat exchangers and common discharge piping for meeting the requirement to have multiple RHR subsystems operable during Cold Shutdown (Operating Condition 4).
- (2) TS 3/4.9.11.1 is revised to require that 1 RHR Shutdown Cooling subsystem shall be operable and in operation, in Operating Condition 5, when irradiated fuel is in the vessel and water level is greater than or equal to 22 feet above the reactor vessel flange. Action and surveillance requirements are also revised to introduce the use of RHR Shutdown Cooling subsystems. The Bases for TS 3/4.9.11.1 is revised to reflect reliance on common heat exchangers and common discharge piping for meeting the requirement to have multiple RHR subsystems operable during the specified applicability.
- (3) TS 3/4.9.11.2 is revised to require that 2 RHR shutdown cooling subsystems shall be operable and one RHR Shutdown Cooling subsystem shall be in operation, in Operating Condition 5, when irradiated fuel is in the vessel and water level is less than 22 feet above the reactor vessel flange. Action and surveillance requirements are revised to introduce the use of RHR shutdown cooling subsystems. The Bases for TS

3/4.9.11.2 is revised to reflect reliance on common heat exchangers and common discharge piping for meeting the requirement to have multiple RHR subsystems operable during the specified applicability.

This change meets the staff's guidance provided in NUREG-1433. Specifically, NUREG 1433, Revision 1, states:

"The two subsystems have a common suction source and are allowed to have a common heat exchanger and common discharge piping. Thus, to meet the LCO [of two operable SDC subsystems], both pumps in one loop or one pump in each of the two loops must be operable. Since the piping and heat exchangers are passive components that are assumed not to fail, they are allowed to be common to both [paired] subsystems."

The staff has reviewed the above three changes to the existing TS requirements and finds that the revised TSs are consistent with the plant design basis as described in the UFSAR and the licensee's application. The staff also finds that the use of RHR Shutdown Cooling subsystem designation is consistent with the designations used in NUREG-1433. The staff also agrees that the four "subsystem" designation has no effect on the required operability of the Residual Heat Removal Service Water (RHRSW) systems. The RHRSW subsystems associated with the required operable RHR heat exchangers will continue to remain operable per TS Section 3.7.1.1. Further, the staff agrees that the required availability of four loops of the Low Pressure Coolant Injection (LPCI) mode of RHR during OPCS 1, 2, and 3, as required by TS Section 3.5.1, is also not affected by the four "subsystem" Shutdown Cooling designation. This conclusion is based on the fact that there is no change to any RHR system instrumentation logic, the required Emergency Core Cooling System (ECCS) availability, or the method of operation.

The design basis for operability of Shutdown Cooling with a single active failure is met through the availability of the alternate cooling flowpaths. As stated in the LGS Updated Final Safety Analysis Report (UFSAR) Sections 15.2.9 and 15.2.9.3.4.2, the first action to be taken upon the (worst case) failure of a Shutdown Cooling suction valve is to gain access to the suction line and attempt to effect repairs. If this can not be accomplished, alternate cooling flowpaths are established in accordance with the remaining functional systems assuming, as an additional failure, the loss of an electrical division. With the four "subsystem" Shutdown Cooling configuration, in the event of a failure of a Shutdown Cooling return valve or check valve, manual actions to effect repairs of the valve will be taken. Should these actions fail, the same analyzed alternate available flowpaths used for failure of a suction valve will allow for return of cooled water to the reactor vessel. Hence, with four "subsystems" of Shutdown Cooling, the requirement for continued availability of Shutdown Cooling following single active failures continues to be satisfied.

In the May 20, 1996 application, the licensee states that reliance on common passive components is not applicable for Hot Shutdown plant conditions. Thus TS 3/4.4.9.1 and its associated Bases have been revised to require that 2 *independent* RHR Shutdown Cooling subsystems shall be operable when no recirculation pumps are operating. At least one RHR shutdown cooling subsystem shall be in operation for the plant conditions specified in the applicability (Operating Condition 3 with reactor pressure vessel pressure less than the RHR cut-in permissive setpoint). Action and surveillance requirements are revised to introduce the use of RHR Shutdown Cooling subsystems. The Bases for TS 3/4.4.9.1 is revised to reflect that reliance on common heat exchangers and common discharge piping is *not* acceptable for meeting the requirement to have multiple RHR subsystems operable during hot shutdown. Rather, the Bases are revised to make clear that independent heat exchangers are required to meet the requirement for independent subsystems. The revision to 3/4 4.9.1 do not represent changes to the existing requirements during hot shutdown. The changes to the Bases designate terminology that is consistent with the changes to TSs 3/4.4.9.2, 3/4.9.11.1 and 3/4.9.11.2.

Based on the above evaluation the staff concludes that the proposed TS changes will not impact the operation of the RHR and RHRSW systems, and that they are consistent with the recommendations in NUREG-1433, Revision 1. Further, as discussed above, Shutdown Cooling capability will continue to be available as required. Therefore, the staff considers the proposed TS changes 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 55036). 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.

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