December 30, 2002

Mr. Bryce L. Shriver
Senior Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT RE: CHANGE TO TECHNICAL SPECIFICATIONS FOR THE RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM AND ULTIMATE HEAT SINK (TAC NOS. MB2119 AND MB2120)

Dear Mr. Shriver:

The Commission has issued the enclosed Amendment No. 206 to Facility Operating License No. NPF-14 and Amendment No. 180 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated June 1, 2001, as supplemented on June 13, 2001, May 20, 2002, and June 28, 2002.

These amendments revise TS 3.7.1 to add operability requirements and surveillance requirements for the ultimate heat sink spray bypass and large array valves, and reduce the allowed Completion Times for the conditions applicable to the residual heat removal service water system.

Although your application included possible wording for the revised Bases discussion for TS 3.7.1, licensees formally address changes to the Bases in accordance with the TS Bases Control Program described in TS 5.5.10.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

/RA/

Timothy G. Colburn, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures: 1. Amendment No. 206 to License No. NPF-14
2. Amendment No. 180 to License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

/RA/

Timothy G. Colburn, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures: 1. Amendment No. 206 to License No. NPF-14
2. Amendment No. 180 to License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

Public	TColburn	ACRS	CHarbuck
PDI-1 R/F	M'OBrien	GHill (4)	FReinhart
BPlatchek	RDennig	RGN-I	RLaufer
OGC	RArchitzel	SWeerakkody	

C:\ORPCheckout\FileNET\ML023650034.wpd
ADAMS Accession Number: ML023650034 TSs: ML Package No.: ML

OFFICE	PDI-1/PM	PDI-2/LA	SPLB	SPSB	RORP	OGC	PDI-1/SC
NAME	TColburn	MO'Brien	SWeerakkody	FReinhart	RDennig	AHodgdon	RLaufer
DATE	12/2/02	12/3/02	SE dtd 10/16/02	SE dtd 8/28/02	12/13/02	12/16/02	12/23/02

OFFICIAL RECORD COPY

Susquehanna Steam Electric Station,
Units 1 &2

Bryan A. Snapp, Esq
Assoc. General Counsel
PPL Services Corporation
2 North Ninth Street GENTW3
Allentown, PA 18101-1179

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 35, NUCSA4
Berwick, PA 18603-0035

Director - Bureau of Radiation Protection
Pennsylvania Deparment of
Environmental Protection
P.O. Box 8469
Harrisburg, PA 17105-8469

Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Board of Supervisors
Salem Township
P.O. Box 405
Berwick, PA 18603-0035

PPL Susquehanna, LLC
Nuclear Records
Attn: G. DallaPalu
2 North Ninth Street GENA62
Allentown, PA 18101-1179

Richard W. Osborne
Allegheny Electric Cooperative, Inc.
212 Locust Street
P.O. Box 1266
Harrisburg, PA 17108-1266

Bryce L. Shriver
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0035

Richard L. Anderson
Vice President-Nuclear Site Operations
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0035

Robert A. Saccone
General Manager - Nuclear Engineering
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0035

Terry L. Harpster
General Manager - Plant Support
PPL Susquehanna, LLC
769 Salem Blvd., NUCSA4
Berwick, PA 18603-0035

Curtis D. Markley
Supervisor - Nuclear Regulatory Affairs
PPL Susquehanna, LLC
769 Salem Blvd., NUCSA4
Berwick, PA 18603-0035

Rocco R. Sgarro
Manager - Nuclear Regulatory Affairs
PPL Susquehanna, LLC
Two North Ninth Street, GENA61
Allentown, PA 18101-1179

Michael H. Crowthers
Supervising Engineer - Nuclear Regulatory Affairs
PPL Susquehanna, LLC
Two North Ninth Street, GENA61
Allentown, PA 18101-1179

Aloysius J. Wrape, III
General Manager - Nuclear Assurance
PPL Susquehanna, LLC
Two North Ninth Street, GENA92
Allentown, PA 18101-1179

Susquehanna Steam Electric Station,
Units 1 &2 Dale F. Roth

Manager - Quality Assurance
PPL Susquehanna, LLC
Two North Ninth Street, GENA92
Allentown, PA 18101-1179

Herbert D. Woodeshick
Special Office of the President
PPL Susquehanna, LLC
Rural Route 1, Box 1797
Berwick, PA 18603-0035

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

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-387

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 206
License No. NPF-14

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:

   A. The application for the amendment filed by PPL Susquehanna, LLC, dated June 1, 2001, as supplemented by letters dated June 13, 2001, May 20, 2002, and June 28, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;

   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 the Facility Operating License No. NPF-14 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 206 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PPL Susquehanna, LLC 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

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: December 30, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 206

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
3.7-1	3.7-1
3.7-2	3.7-2
3.7-3	3.7-3
-	3.7-3a
-	3.7-3b

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 180
License No. NPF-22

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:

   A. The application for the amendment filed by the PPL Susquehanna, LLC, dated June 1, 2001, and supplemented by letters dated June 13, 2001, May 20, 2002, and June 28, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;

   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 the Facility Operating License No. NPF-22 is hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 180 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PPL Susquehanna, LLC 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

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: December 30, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 180

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
3.7-1	3.7-1
3.7-2	3.7-2
3.7-3	3.7-3
-	3.7-3a
-	3.7-3b

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 206 TO FACILITY OPERATING LICENSE NO. NPF-14

AND AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. NPF-22

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 388

1.0 INTRODUCTION

By application dated June 1, 2001, as supplemented by letters dated June 13, 2001, May 20, 2002, and June 28, 2002, PPL Susquehanna, LLC (PPL, the licensee), requested changes to the Technical Specifications (TSs) for Susquehanna Steam Electric Station, Units 1 and 2 (SSES-1 and 2). The supplement dated June 13, 2001 provided signed and notarized affidavits. The supplements dated May 20, 2002, and June 28, 2002, were in response to the staff's Requests for Additional Information (RAI's) dated March 19, 2002, and June 3, 2002 (teleconference between the staff and licensee). The licensee's RAI responses provided additional information that clarified the application, but did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on September 5, 2001 (66 FR 46481).

The proposed changes revise the SSES-1 and 2 TS 3.7.1, "Residual Heat Removal Service Water (RHRSW) System and Ultimate Heat Sink (UHS)," to add operability requirements and surveillance requirements for the UHS spray bypass and large array valves, and reduce the allowed Completion Times for the conditions applicable to the RHRSW system.

The licensee requested these changes because the existing TS 3.7.1 conditions do not account appropriately for the worst-case single failure, identified in a PPL condition report as the failure of a spray bypass valve in one UHS return loop. The TS changes prescribe the necessary administrative controls to direct RHRSW and UHS configuration should equipment become inoperable.

The TS changes modify Section 3.7.1 of the TSs and Section B 3.7.1 of the TS Bases.

TS condition 3.7.1A. is added to cover inoperability of the UHS spray cooling large array valves HV-01224A1 and HV-01224B1, identified in new TS Table 3.7.1-1, and the UHS spray array bypass valves HV-01222A and HV-01222B, identified in new TS Table 3.7.1-2, because of the importance of these valves to UHS and RHRSW system operation. Required Action to declare the associated RHRSW subsystems inoperable upon discovery of an inoperable large spray valve or spray bypass valve is added. Completion Times of 72 hours are established to restore

a valve to OPERABLE status, and 8 hours from the discovery of an inoperable RHRSW subsystem in the opposite loop from the inoperable valve(s).

In addition to adding limiting conditions for operation on the spray array bypass and spray cooling large array valves, surveillance requirements are established for these valves. The purpose of these surveillance requirements is to assure that the valves can be operated manually, as required by design-basis accident analyses. TS Surveillance Requirements 3.7.1.4 and 3.7.1.5 are added to verify every 92 days that the spray bypass valves close and the large spray array valves open on receipt of a close or open signal, respectively.

The existing conditions for one and two RHRSW subsystems inoperable are moved to TS Conditions 3.7.1B. and 3.7.1C., respectively. The Completion Times for returning the subsystems to operable status are shortened from 30 days to 7 days for one RHRSW subsystem inoperable and from 7 days to 72 hours for two RHRSW subsystems inoperable. The proposed Completion Times for these situations are consistent with other TSs for systems with similar safety significance.

The existing Condition for the Required Action and associated Completion Time not met or the UHS inoperable is moved to TS Condition 3.7.1D.

The licensee also revised SSES-1 and 2 TS Section B 3.7.1 Bases to describe the reasons for the proposed changes.

2.0 REGULATORY EVALUATION

The criteria for inclusion of limiting conditions for operation in the TSs are given in Title 10, *Code of Federal Regulations* (10 CFR), Part 50.36. Criterion 3 of 10 CFR 50.36(c)(2)(ii) includes a structure, system or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The primary design basis success path of the RHRSW/UHS assumes the availability of the large spray arrays. Thus, this criterion confirms the need for the large spray array valves to be addressed in the TSs. The spray array bypass valves are required for the large spray array valves to be effective; thus, the spray array bypass valves are also included in the TSs.

The Completion Times assigned for revised TS LCO 3.7.1 are based on the following.

A. A 30-day Completion Time is assigned for a given condition when the following criteria are met:

   1. The overall system continues to meet its design requirements.

   2. An additional, worst-case single failure could be tolerated without losing design function.

   3. The function of any other systems is not affected.

There are no conditions in the proposed TSs for which a 30-day Completion Time can be justified.

B. A 7-day Completion Time is assigned for a given condition when the following criteria are met:

1. The overall system continues to meet its design requirements.

2. An additional, worst-case single failure cannot be tolerated without loss of design function.

3. Neither the function of the opposite unit nor any other system is affected.

C. A 72-hour Completion Time is assigned for a given condition when the following criteria are met:

1. The overall system continues to meet its design requirements.

2. An additional, worst-case single failure cannot be tolerated without loss of design function.

3. An additional, worst-case single failure would compromise the performance of other systems, or could affect conditions on the opposite unit.

D. An 8-hour Completion Time is assigned when the system, for a given condition, cannot meet its design-basis function. The 8-hour time period is allowed to restore the out-of-service equipment because it is safer to allow a reasonable period of time for repair than to endure a challenging unit shutdown.

In addition, these above conditions all result in shutdown if the Completion Times cannot be met. Under normal operating circumstances, the equipment out-of-service is taken as the single failure for design bases evaluations, and no further single failures are considered. However, because of the Completion Time definitions above, a further, worst-case single failure is considered in this evaluation to determine whether the Completion Time should be 7 days or 72 hours. In general, the further, worst-case single failure considered is the failure of the unaffected loop spray bypass valve to close.

Surveillance requirements, as required by 10 CFR 50.36(c)(3), relate to test, calibration or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. The licensee proposed surveillance requirements that test the operability of the spray bypass valves and the large spray array valves that were added to TS 3.7.1.

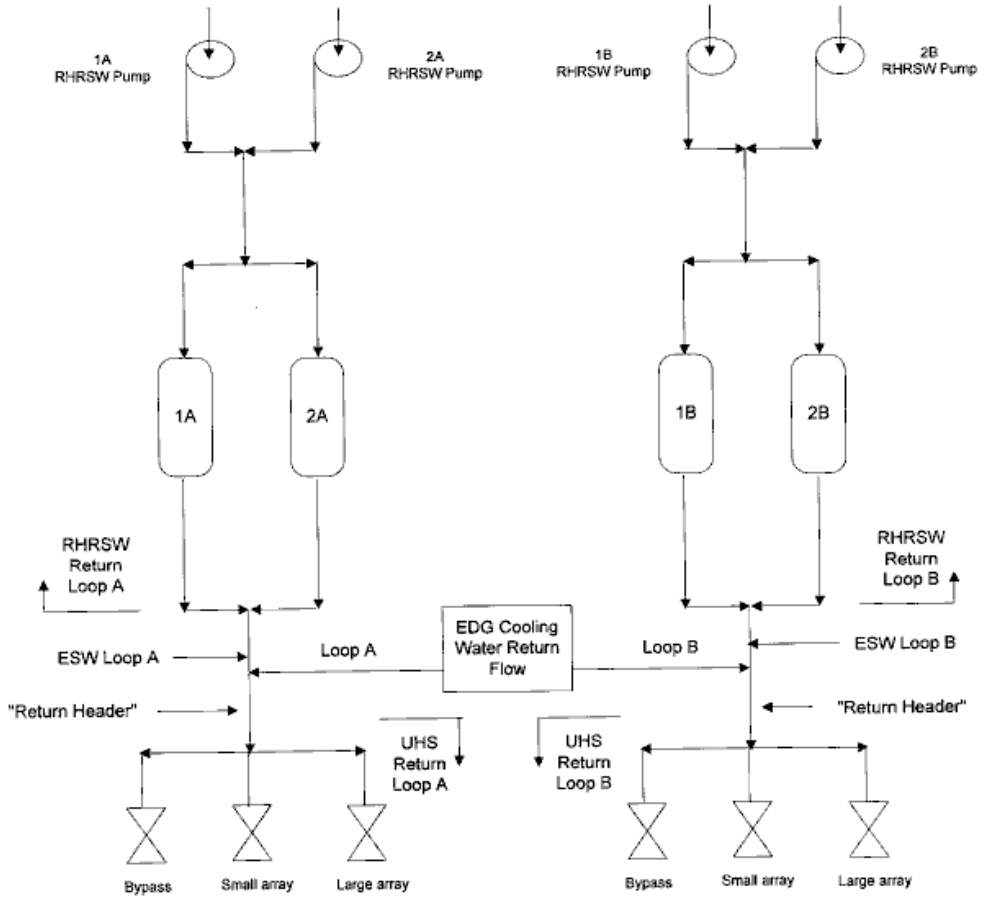
3.0 TECHNICAL EVALUATION

The staff reviewed the application, the Updated Final Safety Analysis Report, previous license amendments and safety evaluations related to these systems, applicable piping and instrumentation diagrams, and responses to the RAIs noted above. The licensee described the RHRSW and UHS systems in the application for amendment. The licensee provided a schematic of the RHRSW/UHS system, which is reproduced as Figure 1 of this evaluation.

The RHRSW system is composed of two loops, with two subsystems assigned to each loop. Each subsystem contains a suction source, one pump, a return header, a heat exchanger, valves, piping and associated instrumentation. The return header is shared with the emergency service water (ESW) system and the other RHRSW subsystem in that loop. The RHRSW pump, taking suction from the ultimate heat sink, pumps cooling water through the tube side of

Figure 1

SSES RHRSW, ESW and UHS System Interfaces and Boundaries



the RHR heat exchanger. After removing heat from the RHR heat exchanger, the water is discharged back to the UHS through the return header. The return header directs the return flow from both RHRSW subsystems and the ESW system to a network of UHS return loops. The return loops are manually controlled and can route the return flow through the spray arrays, where the heat is dissipated directly to the atmosphere, or the spray bypass lines, where the return flow, and consequently the discharged heat, goes directly to the UHS. One of the two large spray arrays or the combination of both small spray arrays is sufficient to remove the shutdown heat load from a design-basis event. The individual RHRSW loops may be aligned to either unit, as required. The minimum requirement for the safe shutdown of both units, under either normal or accident conditions, is that two of these RHRSW subsystems must be operable.

The UHS return loops must be manually aligned to use either set of spray nozzles. Alignment to either array requires manual closure of the spray array bypass valves, which are automatically opened on RHRSW or ESW pump start. The spray bypass valves are normally open and receive an automatic open signal on RHRSW/ESW pump start to prevent the possibility of running the pumps under dead-head conditions. Use of the spray arrays also requires the manual opening of either the large or the small spray array valves, or both valves, if available. Analysis of the design-basis accident for the UHS shows that one large spray array is required to dissipate the heat generated during a design-basis loss-of-coolant accident (LOCA), with concurrent safe shutdown of the non-LOCA unit.

The failure of a spray bypass valve in one UHS return loop to close on demand results in the inability to use the spray arrays on that UHS return loop. The licensee determined this failure to be the worst-case single failure for the combined RHRSW/UHS system. The licensee's UHS design analysis has concluded that, with a spray bypass valve open, opening either of the spray array valves on the affected subsystem would not produce sufficient spray nozzle pressure to effectively transfer the heat load to the environment. Operations staff would not manually load RHRSW pumps on a UHS return loop that has a failed spray array bypass valve, according to plant procedure. Thus, the failure of a spray array bypass valve to close effectively causes two of the four RHRSW subsystems (the subsystems on the loop that contains the failed valve) to be unavailable. The UHS analysis does account for the alignment of ESW system heat loads on the UHS return loop with the failed bypass valve; therefore, the affected ESW subsystems need not be considered inoperable.

Operation of the RHRSW system requires manual actions that are performed according to procedural guidance. The only components in the UHS system that receive an automatic open signal are the spray bypass valves, which receive an automatic open signal (only from their respective loop) given an ESW or RHRSW pump start, to ensure an operable return path to the UHS. The spray bypass valves receive a signal to open and the large spray array valves receive a signal to close when the last ESW/RHRSW pump shuts off. Operation and alignment of the RHRSW system is considered completely manual and does not involve any automatic actions.

The failure of a large spray array valve to open on demand has a significant effect on RHRSW/UHS system performance, because this failure eliminates one of the two large spray arrays from dissipating heat. A 72-hour Completion Time is appropriate because the RHRSW/UHS system can still meet the design requirement with the other large spray array. However, failure of either the bypass valve or the large spray array valve in the other loop would result in the loss of the ability to meet the design requirement. Also, loss of a large spray array has potential effects on both units.

The failure of a spray bypass valve to close on demand results in the loss of spray cooling for an entire loop of RHRSW. That is, the failure of a spray bypass valve to close causes the loss of spray cooling effectiveness for one entire spray loop (the large and small spray arrays associated with the failed spray bypass valve). Under these conditions, the failure of either the opposite loop spray bypass valve or the opposite loop large spray array will result in the RHRSW/UHS system, as well as the ESW system, becoming incapable of meeting their design function. Therefore, the Completion Time for restoring a spray bypass valve to operable is 72 hours, as is shown in proposed TS Condition 3.7.1A. Under the condition when no spray cooling remains, such as when both spray bypass valves become inoperable, entering LCO 3.0.3 is appropriate. An inoperable UHS puts the plant in Condition 3.7.1D., which requires that both units be in hot shutdown within 12 hours followed by cold shutdown within the following 24 hours.

The current TSs allow a Completion Time of 30 days for a single RHRSW subsystem inoperable that is based on the evaluation that the RHRSW system could withstand a further single failure and still perform its intended function. The current Completion Time is based on the worst case single failure of a loss of pump or individual flowpath. Under these conditions, even with the loss of an additional RHRSW pump or individual flow path, all the required, design-basis heat loads for combined LOCA/safe shutdown remain within the capacity of the remaining, intact RHRSW equipment, properly aligned to each unit. However, the failure of a spray bypass valve to close on demand has been determined to be the worst case single failure for the RHRSW/UHS system. Therefore, should one RHRSW subsystem be inoperable, a single failure of the spray bypass valve in the opposite UHS return loop would result in only one RHRSW subsystem operable to shut down both units, a condition beyond the capability of the RHRSW/UHS system under design-basis accident conditions. As a result, the proposed Completion Time for returning an inoperable loop to service (Condition 3.7.1B.) is reduced from 30 days to 7 days.

In the case when two RHRSW subsystems are inoperable, a further single failure would result in a situation where the system would not meet the design requirements. In addition, with two RHRSW subsystems inoperable, a failure of the spray bypass valve to close would result in the complete loss of spray cooling. Therefore, the proposed Completion Time for restoring two RHRSW subsystems to operable status (Condition 3.7.1C.) is 72 hours.

In the case where more than two RHRSW subsystems become inoperable at the same time, the RHRSW/UHS system could no longer meet its intended design function should a design- basis accident occur. Under these circumstances, unless at least the equivalent of two RHRSW subsystems can be returned to operable status in 8 hours, an orderly plant shutdown is required. The orderly plant shutdown is preferred because an orderly shutdown allows the bulk of the decay heat removed from the units to go to the condenser and then be dissipated through the service water system and the cooling towers, rather than challenging the ESW/RHRSW/UHS systems.

The revised TS 3.7.1 RHRSW/UHS conditions and actions, along with the current conditions and actions, are summarized in the following table:

Table 1

Summary of Equipment Out of Service and Proposed Completion Times

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
x								3.7.1B	7 Days – Unit 1 None – Unit 2	30Days – Unit 1 None – Unit 2	Only 1 RHRSW subsystem affected; no effect on ESW
	x							3.7.1B	None – Unit 1 7 Days – Unit 2	None – Unit 1 30Days – Unit 2	Only 1 RHRSW subsystem affected; no effect on ESW
		x						3.7.1B	7 Days – Unit 1 None – Unit 2	30Days – Unit 1 None – Unit 2	Only 1 RHRSW subsystem affected; no effect on ESW
			x					3.7.1B	None – Unit 1 7 Days – Unit 2	None – Unit 1 30Days – Unit 2	Only 1 RHRSW subsystem affected; no effect on ESW
x		x						3.7.1C	72 Hrs. – Unit 1 None – Unit 2	7 Days – Unit 1 None – Unit 2	RHRSW System not Single Failure Proof; no effect on ESW
	x		x					3.7.1C	None – Unit 1 72 Hrs. – Unit 2	None – Unit 1 7 Days – Unit 2	RHRSW System not Single Failure Proof; no effect on ESW
x	x							3.7.1B 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 2	7 Days – Unit 1 7 Days – Unit 2	RHRSW System not Single Failure Proof; no effect on ESW
		x	x					3.7.1B 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 2	7 Days – Unit 1 7 Days – Unit 2	RHRSW System not Single Failure Proof; no effect on ESW
x	x	x						3.7.1C 3.7.1B	8 Hrs. – Unit 1 72 Hrs. – Unit 2	8 Hrs. – Unit 1 7 Days – Unit 2	Insufficient RHRSW Capacity remaining; no effect on ESW

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
x		x	x					3.7.1C 3.7.1B	8 Hrs. – Unit 1 72 Hrs. – Unit 2	8 Hrs. – Unit 1 7 Days – Unit 2	Insufficient RHRSW Capacity remaining; no effect on ESW
x	x		x					3.7.1C 3.7.1B	72 Hrs. – Unit 1 8 Hrs. – Unit 2	7 Days – Unit 1 8 Hrs. – Unit 2	Insufficient RHRSW Capacity remaining; no effect on ESW
	x	x	x					3.7.1B 3.7.1C	72 Hrs. – Unit 1 8 Hrs. – Unit 2	7 Days – Unit 1 8 Hrs. – Unit 2	Insufficient RHRSW Capacity remaining; no effect on ESW
				x				3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note 1	RHRSW and ESW return path affected
					x			3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note1	RHRSW and ESW return path affected
						x		3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note1	RHRSW and ESW return path affected

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
							x	3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note1	RHRSW and ESW return path affected
				x		x		3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note 1	RHRSW and ESW return path affected
					x		x	3.7.1A & 3.7.1B 3.7.1A & 3.7.1B	72 Hrs. – Unit 1 72 Hrs. – Unit 1 72 Hrs. – Unit 2 72 Hrs. – Unit 2	Note1	RHRSW and ESW return path affected
		x				x		3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
			x			x		3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
x							x	3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
	x						x	3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
		x		x				3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
			x	x				3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
x					x			3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
	x				x			3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
		x		x		x		3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
			x	x		x		3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
x					x		x	3.7.1A & 3.7.1C 3.7.1A & 3.7.1B	8 Hrs. – Unit 1 8 Hrs. – Unit 1 8 Hrs. – Unit 2 72 Hrs. – Unit 2	30 Days– Unit 1 & Note1- Unit 1 Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
	x				x		x	3.7.1A & 3.7.1B 3.7.1A & 3.7.1C	8 Hrs. – Unit 1 72 Hrs. – Unit 1 8 Hrs. – Unit 2 8 Hrs. – Unit 2	Note1- Unit 1 30Days– Unit 2 & Note1- Unit 2	Insufficient RHRSW Capacity Remaining and ESW return path affected
x	x	x	x					3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	S/D – Unit 1 S/D – Unit 2	Insufficient RHRSW Capacity and No Effect on ESW
						x	x	3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity
					x	x		3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity
				x			x	3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity and ESW System affected
				x	x			3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity

Unit 1 RHRSW A	Unit 2 RHRSW A	Unit 1 RHRSW B	Unit 2 RHRSW B	Lg Spr Array A	Lg Spr Array B	Spr BP Valve A	Spr BP Valve B	**Condition**	Proposed Completion Time	Current Completion Time	Justification
				x	x	x		3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity
				x	x		x	3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient spray Capacity
				x		x	x	3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity
				x	x	x	x	3.0.3 3.0.3	S/D – Unit 1 S/D – Unit 2	Note 2	Insufficient Spray Capacity

(Notes 1. Condition not specifically addressed in current TSs. The licensee has implemented administrative controls to follow the actions for these conditions as stated in the proposed TSs.

2. Although current TSs do not specifically address these valves, shutdown is required for both Unit 1 and Unit 2 for an inoperable UHS.

3. An “x” in any column indicates that the component is out of service.)

In all cases the proposed Completion Times are shorter than or the same as the current requirements. The Completion Times for the conditions identified are consistent with the basis for revised TS LCO 3.7.1 discussed in the Regulatory Evaluation Section above.

New Surveillance Requirements 3.7.1.4 and 3.7.1.5 are established for the spray bypass valves and the large spray array valves, respectively, in this TS change so that operability of these important valves can be periodically verified. The spray loop bypass valves are tested to close upon receipt of a closing signal and the large spray array valves are tested to open on receipt of an opening signal. A frequency requirement of 92 days is established and is consistent with the current surveillance frequency of these valves.

Failure of either or both of the small array valves to open on demand is not included in the RHRSW/UHS TS. The licensee determined that these valves do not meet the criteria of 10 CFR 50.36(c)(2)(ii)(D) for inclusion in the TSs. The small spray arrays are included in the system design to allow operational flexibility during system testing. A small spray array can accommodate the return flow from an entire ESW loop plus one RHRSW pump; therefore, one small spray array can be used when RHR pump surveillance tests are conducted, as well as the return flow to the UHS when suppression pool cooling is in operation. However, failure of either or both small spray arrays does not impact the availability of the large spray array valves, and the RHRSW/UHS system remains single failure proof. Failure of one of the large spray array valves to open on demand leaves the plant with a single large spray array and two small spray arrays available. This configuration is not single failure proof, because a failure of the spray bypass valve in the opposite loop results in only a single small spray array available for heat dissipation, which is insufficient to dissipate the heat transferred in the design-basis event. Two small spray arrays are equivalent in heat dissipation to one large spray array and can be used in the design-basis event if neither large spray array is available. The small spray arrays are only effective when the bypass valves properly close on demand; therefore, both small spray arrays in operation require both spray bypass valves to close.

In the absence of specific guidance for addressing Criterion 4 in 10 CFR 50.36, the licensee has performed risk-informed assessments of safety significance for the UHS components as the basis for determining whether or not the components in question are “significant” to public health and safety. These assessments have been made using a risk ranking process based on a probabilistic risk assessment and insights from the licensee’s Maintenance Rule Expert Panel and Generic Letter 89-10 Expert Panel (Motor Operated Valves). Based on these assessments, the licensee classified the spray bypass valves and large spray array valves as High Safety Significant. These valves provide a redundant primary means of success for the RHRSW system and ESW system. While the small array valves can provide a back-up success path under some conditions, the time requirement for these valves to operate is greater than 4 hours, which allows for manual actuation of these valves if either of the primary success paths cannot be recovered. These factors are significant contributors to the relatively low-risk importance of the small array valves which have driven the licensee’s significance determination for these valves to a non-risk significant classification.

The staff believes that, in the absence of specific staff guidance for addressing Criterion 4 in 10 CFR 50.36, the licensee’s ad hoc, risk-informed assessment is a reasonable means of addressing Criterion 4 of 10 CFR 50.36 for the small array valves at SSES-1 and 2 because it utilizes probabilistic risk assessment and also allows for insights from operating experience to be brought to bear via the expert panel review process. In addition, the staff agrees with the results

of the assessment. Specifically, the staff believes that, from a risk perspective, TS controls on these valves are not necessary to ensure that the public is adequately protected. This is due to the availability of multiple redundant and diverse primary success paths, the relatively long time available for recovery of these primary success paths and the fact that automatic actuation of the small array valves is not required.

The licensee also considered the single failure of one of the small spray array valves, which are normally closed, to close when only the large spray array is required to reject the heat. Under these conditions, flow would be diverted from the large spray array nozzles to the small array, therefore reducing the spray efficiency of the large array. Based on previous calculations, the additional spray area resulting from the small array valves becoming available for heat dissipation more than makes up for the reduced efficiency of the large spray array.

The TS revision discussed herein is based upon maintaining the UHS temperature within the design bounds during hot weather operation. During cold weather, or winter, operation, the main concern is the avoidance of destroying the spray nozzles as a result of freezing. There are no requirements in this revised TS that are inconsistent with cold weather operations.

The application also addressed how potential effects on the ESW TS 3.7.2 were considered. The specification for ESW requires an operable UHS, determined by TS 3.7.1. The design-basis analysis allows some ESW flow through the failed loop; therefore, ESW can be considered operable as long as a return loop exists, even if a spray array is unavailable. Therefore, ESW remains operable as long as the UHS is operable and no additional constraints on ESW are required.

Because of the importance of the RHRSW/UHS system operability on the ability of both units to safely shut down, the Required Action to shut down was considered by the licensee. However, under non-accident conditions and with off-site power sources available, the challenge to the RHRSW/UHS systems would not be severe, since the condenser could be used and the emergency diesel generators, a significant UHS heat load, are not required. Therefore, shutting both units down in an orderly manner with reduced RHRSW capability is preferable to allowing the plant to continue operation with the possibility that an unforeseen transient would significantly challenge the RHRSW/UHS and the other associated safety-related systems.

The proposed license amendment revisions to the allowed outage times for RHRSW system equipment and added operability and surveillance requirements for the UHS spray bypass and large spray array valves are acceptable to the staff.

4.0 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.

5.0 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 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 (66 FR 46481). 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.

6.0 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: R. Architzel
C. Harbuck

Date: December 30, 2002