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

November 9, 2009

Mr. Timothy S. Rausch
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: EMERGENCY CORE COOLING SYSTEM INSTRUMENTATION - TECHNICAL SPECIFICATION (TS) TABLE 3.3.5.1-1 AND EDITORIAL CHANGE TO TS 3.10.8.f (TAC NOS. ME0933 AND ME0934)

Dear Mr. Rausch:

The Commission has issued the enclosed Amendment No. 254 to Facility Operating License No. NPF-14 and Amendment No. 234 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2 (SSES 1 and 2). These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated March 24, 2009, as supplemented by letters dated April 24, and September 11, 2009.

These amendments revised the allowable value in the TS Table 3.3.5.1-1 (Function 3.d) for the high-pressure coolant injection (HPCI) automatic pump suction transfer from the condensate storage tank (CST) to the suppression pool. The present allowable value for this transfer is greater than or equal to 36 inches above the CST bottom. These amendment increased the allowable value for this transfer to occur at greater than or equal to 40.5 inches above the CST bottom. Additionally, the amendments also included an editorial/administrative change which corrected a typographical error in the SSES Units 1 and 2 TS Section 3.10.8.f.

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

Sincerely,

B.K. Vaidya

Bhalchandra K. Vaidya, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures:
1. Amendment No. 254 to
 License No. NPF-14
2. Amendment No. 234 to
 License No. NPF-22
3. Safety Evaluation

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

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-387

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 254
License No. NPF-14

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

   A. The application for the amendment dated March 24, 2009, as supplemented by letters dated April 24, and September 11, 2009, filed by PPL Susquehanna, LLC, 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 No254 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

Douglas V Pickett for

Nancy L. Salgado, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and
Technical Specifications

Date of Issuance: November 9, 2009

ATTACHMENT TO LICENSE AMENDMENT NO. 254

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

Replace the following page of the Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
Page 3	Page 3

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
3.3-44	3.3-44
3.10-20	3.10-20

(4) PPL Susquehanna, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) PPL Susquehanna, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

PPL Susquehanna, LLC is authorized to operate the facility at reactor core power levels not in excess of 3952 megawatts thermal in accordance with the conditions specified herein. The preoperational tests, startup tests and other items identified in License Conditions 2.C.(36), 2.C.(37), 2.C.(38), and 2.C.(39) to this license shall be completed as specified.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 254 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.

For Surveillance Requirements (SRs) that are new in Amendment 178 to Facility Operating License No. NPF-14, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 178. For SRs that existed prior to Amendment 178, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 178.

(3) Conduct of Work Activities During Fuel Load and Initial Startup

The operating licensee shall review by committee all facility construction, Preoperational Testing, and System Demonstration activities performed concurrently with facility initial fuel loading or with the facility Startup Test

Table 3.3.5.1-1 (page 3 of 6)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. LPCI System (continued)					
f. Manual Initiation	1,2,3, 4(a), 5(a)	2 1 per subsystem	C	SR 3.3.5.1.5	NA
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level—Low, Level 2	1, 2(e), 3(e)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -45 inches
b. Drywell Pressure—High	1, 2(e),3(e)	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≤ 1.88 psig
c. Reactor Vessel Water Level—High, Level 8	1, 2(e), 3(e)	2	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≤ 55.5 inches
d. Condensate Storage Tank Level—Low	1, 2(e), 3(e)	2	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≥ 40.5 inches above tank bottom

(continued)

(a) When the associated subsystem(s) are required to be OPERABLE.

(e) With reactor steam dome pressure > 150 psig.

3.10 SPECIAL OPERATIONS

3.10.8 SHUTDOWN MARGIN (SDM) Test - Refueling

LCO 3.10.8 The reactor mode switch position specified in Table 1.1-1 for MODE 5 may be changed to include the startup/hot standby position, and operation considered not to be in MODE 2, to allow SDM testing, provided the following requirements are met:

a. LCO 3.3.1.1, "Reactor Protection System Instrumentation," MODE 2 requirements for Functions 2.a, 2.d, and 2.e of Table 3.3.1.1-1;

b. 1. LCO 3.3.2.1, "Control Rod Block Instrumentation," MODE 2 requirements for Function 2 of Table 3.3.2.1-1, with the banked position withdrawal sequence requirements of SR 3.3.2.1.8 changed to require the control rod sequence to conform to the SDM test sequence.

<u>OR</u>

2. Conformance to the approved control rod sequence for the SDM test is verified by a second licensed operator or other qualified member of the technical staff;

c. Each withdrawn control rod shall be coupled to the associated CRD;

d. All control rod withdrawals that are not in conformance with the BPWS shall be made in notch out mode;

e. No other CORE ALTERATIONS are in progress; and

f. CRD charging water header pressure $\geq$ 940 psig.

APPLICABILITY: MODE 5 with the reactor mode switch in startup/hot standby position.

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

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No 234
License No. NPF-22

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

   A. The application for the amendment dated March 24, 2009, as supplemented by letters dated April 24, and September 11, 2009, filed by the PPL Susquehanna, LLC, 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. 234 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

Douglas V Pickett for

Nancy L. Salgado, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and
Technical Specifications

Date of Issuance: November 9, 2009

ATTACHMENT TO LICENSE AMENDMENT NO. 234

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

Replace the following page of the Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
Page 3	Page 3

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
3.3-45	3.3-45
3.10-20	3.10-20

(4) PPL Susquehanna, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) PPL Susquehanna, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

PPL Susquehanna, LLC is authorized to operate the facility at reactor core power levels not in excess of 3952 megawatts thermal in accordance with the conditions specified herein. The preoperational test, startup tests and other items identified in License Conditions 2.C.(20), 2.C.(21), 2.C.(22), and 2.C.(23) to this license shall be completed as specified.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No234 , 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.

For Surveillance Requirements (SRs) that are new in Amendment 151 to Facility Operating License No. NPF-22, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 151. For SRs that existed prior to Amendment 151, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 151.

2.C.(3) PPL Susquehanna, LLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Review Report for the facility and as approved in Fire Protection Program, Section 9.5, SER, SSER#1, SSER#2, SSER#3, SSER#4, SSER#6, Safety Evaluation of Fire Protection dated August 9, 1989, Safety Evaluation

Table 3.3.5.1-1 (page 3 of 5)

Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level—Low Low, Level 2	1, $2^{(e)}$, $3^{(e)}$	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -45 inches
b. Drywell Pressure—High	1, $2^{(e)}$,$3^{(e)}$	4	B	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≤ 1.88 psig
c. Reactor Vessel Water Level—High, Level 8	1 $2^{(e)}$, $3^{(e)}$	2	C	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≤ 55.5 inches
d. Condensate Storage Tank Level—Low	1, $2^{(e)}$, $3^{(e)}$	2	D	SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5	≥ 40.5 inches above tank bottom
e. Manual Initiation	1, $2^{(e)}$, $3^{(e)}$	1	C	SR 3.3.5.1.5	NA

(continued)

(a) When the associated subsystem(s) are required to be OPERABLE.

(e) With reactor steam dome pressure > 150 psig.

3.10 SPECIAL OPERATIONS

3.10.8 SHUTDOWN MARGIN (SDM) Test - Refueling

LCO 3.10.8 The reactor mode switch position specified in Table 1.1-1 for MODE 5 may be changed to include the startup/hot standby position, and operation considered not to be in MODE 2, to allow SDM testing, provided the following requirements are met:

a. LCO 3.3.1.1, "Reactor Protection System Instrumentation," MODE 2 requirements for Functions 2.a, 2.d and 2.e of Table 3.3.1.1-1;

b. 1. LCO 3.3.2.1, "Control Rod Block Instrumentation," MODE 2 requirements for Function 2 of Table 3.3.2.1-1, with the banked position withdrawal sequence requirements of SR 3.3.2.1.8 changed to require the control rod sequence to conform to the SDM test sequence.

OR

2. Conformance to the approved rod sequence for the SDM test is verified by a second licensed operator or other qualified member of the technical staff;

c. Each withdrawn control rod shall be coupled to the associated CRD;

d. All control rod withdrawals that are not in conformance with the BPWS shall be made in notch out mode;

e. No other CORE ALTERATIONS are in progress; and

f. CRD charging water header pressure $\geq$940 psig.

APPLICABILITY: MODE 5 with the reactor mode switch in startup/hot standby position.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 254 TO FACILITY OPERATING LICENSE NO. NPF-14

AND AMENDMENT NO. 234 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 March 24, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090920414), as supplemented by letters dated April 24, and September 11, 2009 (ADAMS Accession Nos. ML0910200615 and ML092580088, respectively), PPL Susquehanna, LLC (the licensee), requested changes to the Technical Specifications (TSs) for Susquehanna Steam Electric Station, Units 1 and 2 (SSES-1 and 2).

The proposed changes would revise the allowable value in the TS Table 3.3.5.1-1 (Function 3.d) for the high-pressure coolant injection (HPCI) automatic pump suction transfer from the condensate storage tank (CST) to the suppression pool (SP). The present allowable value (AV) for this transfer is greater than or equal to 36 inches above the CST bottom. These amendments increase the allowable value for this transfer to occur at greater than or equal to 40.5 inches above the CST bottom. Additionally, the amendments also included an editorial/administrative change which corrected a typographical error in the SSES Units 1 and 2 TS Section 3.10.8.f.

2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the proposed TS changes in the application against the regulatory requirements and guidance listed below to ensure that there is reasonable assurance that the systems and components affected by the proposed TS changes will perform their safety functions.

2.1 Regulatory Requirements

The NRC staff considered the following regulatory requirements:

- Title 10 of the *Code of Federal Regulations* (10 CFR), 50.2, "Definitions," defines safety-related structures, systems and components as those structures, systems and components that are relied upon to remain functional during and following design-basis events to ensure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe-shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the applicable guideline exposures set forth in 10 CFR 50.34(a)(1) or 10 CFR 100.11, "Determination of exclusion area, low population zone, and population center distance," of this chapter, as applicable.

- In 10 CFR 50.36, "Technical specifications," the Commission established its regulatory requirements related to the contents of the TS. Specifically, 10 CFR 50.36 states that "[e]ach applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section."

  Furthermore, 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded." These limiting safety system settings (LSSSs) are referred to as safety-limit-(SL)-related LSSSs and non-SL-related LSSSs.

  Specifically, 10 CFR 50.36(c)(2) defines limiting conditions for operation as "the lowest functional capability or performance levels of equipment required for safe operation of the facility."

  In addition, 10 CFR 50.36(c)(3) states, "Surveillance requirements are requirements relating 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 limiting conditions of operation will be met." The NRC staff reviewed the proposed TS changes against these 10 CFR 50.36 requirements to ensure that there is reasonable assurance that the systems affected by the proposed TS changes will perform their required safety functions.

- The 10 CFR 50.49(b)(1)(ii) requirement defines design-basis events as conditions of normal operation, including anticipated operational occurrences (AOOs), design-basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions 10 CFR 50.49(b)(1)(i)(A) through 10 CFR 50.49(b)(1)(i)(C) of 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."

- General Design Criterion (GDC) 10, "Reactor Design," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, in part, that the reactor protection systems shall be designed with appropriate margin to ensure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of AOOs.

- GDC 13, "Instrumentation and Control," of Appendix A to 10 CFR Part 50 requires that instrumentation be provided to monitor variables and systems and that controls be provided to maintain these variables and systems within prescribed operating ranges during normal operation, AOOs, and accident conditions. Specifically, the NRC staff reviewed the proposed TS changes and the affected instrument setpoint calculations and plant surveillance procedures to ensure proper operation of the high-pressure core spray and reactor core isolation cooling systems.

- GDC 20, "Protection System Functions," of Appendix A to 10 CFR Part 50 requires, in part, that the protection system be designed to automatically initiate the operation of appropriate systems, including the reactivity control systems, to ensure that specified acceptable fuel design limits are not exceeded as a result of AOOs. The NRC staff evaluated the license amendment request (LAR) to ensure that the proposed TS change will still protect the fuel design limits and plant SLs specified in TS 2.0 and that these SLs will not be exceeded under plant transient, AOO, and accident conditions.

2.2 Regulatory Guidance

The NRC staff considered the following regulatory guidance:

- Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," Revision 3, issued December 1999 (ML993560062), describes a method that the NRC staff considers acceptable for complying with the agency's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits. Section 3.13, "Instrument Spans and Setpoints," of the Susquehanna final safety analysis report states that the plant design meets the provisions of RG 1.105, Revision 1, issued November 1976, with exceptions as noted in that section. RG 1.105 endorses Part I of Instrument Society of America S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation," subject to NRC staff clarifications. The NRC staff used this guide to establish the adequacy of the licensee's setpoint calculation methodologies and the related plant surveillance procedures.

- Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical specifications,' regarding Limiting Safety System Settings during Periodic Testing and Calibration of Instrument Channels,'" dated August 24, 2006 (ML051810077) addresses the 10 CFR 50.36 requirements on LSSSs assessed during the testing and calibration of instrumentation. RIS 2006-17 discusses why compliance to the AVs in the TS during testing or calibration alone is not sufficient to ensure that the SLs will be protected until the next periodic surveillance. RIS 2006-17 also suggests (1) verifying that the change in the measured trip setpoint during testing or calibration is within predefined limits (acceptable as-found and as-left tolerances) and (2) taking appropriate actions if the trip setpoint is outside these limits as a method that meets the requirements of 10 CFR 50.36. However, it is recognized in RIS 2006-17 that other methods and approaches may also be acceptable. The NRC staff used RIS 2006-17 to evaluate the effects of the proposed TS changes on the plant SLs, the acceptability of the setpoint calculation methodology, and the adequacy of the proposed TS changes to meet the requirements of 10 CFR 50.36.

- RIS 2006-17 provides guidance for identifying functions for which SLs have been placed to meet the requirements of 10 CFR 50.36(c)(1)(ii)(A). RIS 2006-17 specifically refers to Section 2.1.1, "Reactor Core SLs," of NUREG-1433, "Standard Technical Specifications—General Electric Plants (BWR/4)," issued June 2004. Susquehanna TS 2.1.1.3 states that the "[r]eactor vessel water level shall be greater than the top of active irradiated fuel" without mentioning any limitation on the TS mode or applicable condition.

- RIS 2006-17 addresses the NRC staff position on LSSSs assessed during the periodic testing and calibration of instrumentation. This RIS discusses issues that could occur during the testing of LSSSs and that may, therefore, have an adverse effect on equipment operability.

- The letter from Patrick L. Hiland, NRC, to the Nuclear Energy Institute Setpoint Methods Task Force, "Technical Specification for Addressing Issues Related to Setpoint Allowable Values," dated September 7, 2005 (ML052500004), is complementary to RIS 2006-17.

3.0 TECHNICAL EVALUATION

3.1 Evaluation Related to System Design and Operations

The primary source of water for the high-pressure coolant injection (HPCI)/reactor core isolation cooling (RCIC) systems is the non-safety related CST. The HPCI system is designed to automatically transfer pump suction source from the CST to the safety-related suppression pool when the CST level decreases to the low level transfer setpoint at 43.50 inches above the CST tank bottom. The suction source transfer function is initiated by redundant, safety-related float type level switches, installed in a fixed location on the CST wall approximately 43.50 inches above the CST tank bottom. The level switches are mechanical devices and are set high enough to assure adequate net positive suction head (NPSH) to the pumps and to prevent unacceptable vortex formation in the suction piping to ensure safe operation during the CST to SP switchover. These level switches also initiate an alarm in the control room. The alarm setpoint and the suction transfer setpoint are the same. The HPCI/RCIC systems provide makeup water to the RPV during accident conditions.

The licensee found that the current TS AV of 36 inches above the CST tank bottom for a HPCI system, CST low level transfer, to be non-conservative, and that results in possibility of vortex formation in the HPCI suction line from the CST during the transfer process. Also the previous calculation did not adequately account for the stroke times of the HPCI suction valves to complete the suction transfer.

The licensee performed new calculations to determine the proposed CST level above the CST tank bottom. The licensee developed a hydraulic model of the HPCI and RCIC pump suction piping based on conservations of mass and mechanical energy. The hydraulic model considered the following:

(1) The Susquehanna Unit 1 HPCI and RCIC systems were modeled. Differences between the suction piping on Units 1 and 2 are relatively small. The results of these calculations would be applicable to Unit 2 for purpose of evaluating the potential for vortex formation because the distance from the CST to HPCI and RCIC pumps on Unit 1 is less than on

Unit 2. The CST suction line losses would be smaller for Unit 1 which would result in slightly higher flow from the CST during the suction transfer that would minimize the CST level, thus reducing margin to the onset of vortex formation.

(2) The CST and the SP suction valves for the HPCI system operate in parallel rather than in series as currently designed to reduce the overall transfer time.

(3) Both HPCI and RCIC are assumed to be in operation to simulate the worst case conditions during a suction transfer. Total HPCI and RCIC flow is constant during the transfer.

(4) The RCIC suction transfer setpoint will remain at the current TS value of 36 inches which maintains adequate RCIC pump suction to remain above the CST vortex limit.

(5) The HPCI and RCIC valves stroke times are considered.

The hydraulic model determined the CST level versus time during a HPCI suction transfer from the CST to the SP. Pressure drop relations were developed for the HPCI suction piping to predict the change in flow in each suction line as the suction valves changed positions. The model incrementally calculated the change in flow in each line and the corresponding change in the CST level until the suction valves completed their position change. The initial CST level, assumed in the model, was adjusted until the final level in the CST was determined to be acceptable after a suction transfer. Acceptable results were achieved when the final level was determined to be at or above the vortex breaker elevation (30.875 inches above tank bottom although the analysis used 32 inches to account for installation uncertainties) in the CST, or the level was determined to be above the onset of air ingestion curve, as defined in the document, Sanders, R.R. Smith, L.A., Padmanabhaw, M. Johnson, A., and Hafer, D. R., "Air Entrainment in a Partially Filled Horizontal Pump Suction Line," Proceedings of 2001 International Joint Power Conference, New Orleans, June 4-7, 2001. The evaluation considered high flow and slow stroke time to maximize the decrease in CST level during the transfer, thereby assuring a conservative allowable value for the suction transfer. The model demonstrated that when the HPCI suction transfer was initiated at CST level of 40.50 inches above the CST tank bottom, acceptable results were achieved precluding vortex formation and air intrusion.

The General Electric (GE) documentation associated with the operation of these float type level switches indicates that the process setpoint should be 3 inches above the allowable value to establish adequate margin to the allowable value. Therefore, for SSES-1 and 2, these float type level switches are installed in a fixed location on the CST wall approximately 43.50 inches above the CST tank bottom consistent with the GE recommendation. This location of 43.50 inches establishes the setpoint for initiation of the automatic HPCI suction source transfer as the CST level decreases to 43.50 inches above the CST tank bottom. This fixed location of 43.50 inches would provide assurance that the float level switches will not actuate below the proposed 40.50 inches allowable value. The HPCI suction transfer will occur prior to the CTS level reaching the proposed TS allowable value. The proposed allowable value of 40.50 inches will assure satisfactory pump performance during a suction transfer from the CST to the SP. The operating history of these float type level switches for SSES-1 and 2, has been reliable and their "as found" settings have been consistently within "as left" final tolerance as demonstrated by the quarterly surveillance findings over the years.

3.2 Evaluation Related to Instrumentations and Controls

RIS 2006-17 specifies requirements for LSSSs in TS. By letter dated March 24, 2009, the licensee stated, "Since the float level switches do not provide any automatic trip function for protection against a violation of a Reactor Core Safety Limit (SL), or a Reactor Coolant System Pressure Safety Limit, during an anticipated operational occurrence (AOO), a normal operational transient, or steady state operation, the allowable value for their operation is not considered to be a Limiting Safety System Setting (LSSS)." The NRC staff found this statement unacceptable because the HPCI system is designed to automatically transfer the HPCI pump suction sources from the non-safety-related CST to the safety-related suppression pool if the CST level decreases below the low-level transmitter setpoint, thereby ensuring that the HPCI is able to maintain the plant SL specified in Susquehanna TS 2.1.1.3, which states that the "[r]eactor vessel water level shall be greater than the top of active irradiated fuel." By letter dated April 24, 2009, the licensee withdrew this statement.

In support of the proposed TS change to increase the AV of the HPCI system CST level-low instrumentation from 36 inches above the CST bottom to 40.5 inches above the CST bottom, the licensee stated in its letter dated September 11, 2009, that "[t]he TS limits for the 'CST Level-Low' function has a specified design-basis limit, which assures adequate Net Positive Head to the HPCI pumps while preventing unacceptable vortex formation in the pump suction piping." During a conference call on September 11, 2009, the licensee confirmed that this design-basis limit is 40.5 inches above the CST bottom and that the same value is being proposed as the AV for the CST level-low instrumentation. Currently, the licensee is issuing 43.5 inches as the process setpoint, which is usually called the nominal trip setpoint, and the licensee is not changing this setpoint.

The CST level-low switches are mechanical-type Magnetrol float switches. The licensee has performed a drift evaluation on eight of these HPCI and RCIC system switches over a 3.75-year period, a total of 32 readings. Based on this evaluation, the licensee selected an as-found tolerance of $\pm$2 inches and an as-left tolerance of $\pm$1 inch for these switches. The NRC staff has reviewed these drift values and finds that the maximum drift has been 0.875 inches for these switches, which is less than one-half of the as-found tolerance of $\pm$2 inches, and even less than the as-left tolerance of $\pm$1 inch. These documented drift values indicate that the licensee did not have to readjust any float switch settings during any calibration test. The licensee also stated that its instrumentation and control personnel familiar with these surveillance tests confirmed that Magnetrol float switches did not require any adjustment to maintain the "final" (as-left) tolerance band.

On February 23, 2009, the Technical Specifications Task Force (TSTF) sent a letter, "Industry Plan To Resolve TSTF-493, 'Clarify Application of Setpoint Methodology for LSSS Functions'" (ML090540849), to the NRC. This letter lists the instrument functions that TSTF-493 recommends for annotation with TSTF-493 footnotes. By letter dated March 9, 2009, the NRC agreed with the recommendations of the TSTF-493 letter. This TSTF-493 letter states that mechanical devices in the HPCI system CST level-low instrumentation for NUREG-1433 are excluded from TSTF-493 footnotes. The NRC staff agrees that, based on the drift data recorded during plant calibration tests, the mechanical-type Magnetrol float switches do not need to be reset during calibration tests and that there is no need to add any footnotes mentioned in the February 23, 2009, letter from the TSTF.

In response to NRC staff request for additional information, the licensee stated in its letter dated September 11, 2009, that the as-left trip settings are controlled under its programs for surveillance testing and preventative maintenance. As-found settings that are outside acceptable tolerances are controlled through Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50. Operability and reportability determinations are integral to the corrective action program. The as-found and as-left tolerances specified in calculations are incorporated into appropriate surveillance procedures. The surveillance testing program establishes the administrative controls for surveillance testing, which include the following:

- specifying requirements for preparation and control of surveillance test procedures,

- specifying the requirement to generate a condition report for any failed calibration activity that references a surveillance procedure.

The procedure for the maintenance and calibration of installed plant instrumentation defines the responsibilities and controls for instrumentation and control activities that affect installed plant instrumentation. This process applies to activities associated with testing, calibration, corrective maintenance, and modification.

Calibration corrective action is controlled under this procedure, which includes the following requirements:

- If an instrument is found outside of the as-found tolerance, it shall be calibrated and left within the final tolerance.

- An action request shall be generated for any equipment exceeding as-found tolerances or any other condition considered adverse to quality.

- The action request is processed as required by the corrective action process, "Action Request and Condition Report Process."

Based on the information provided above, the NRC staff finds that the proposed TS change to increase the AV for the HPCI system CST level-low instrumentation from 36 inches to 40.5 inches is consistent with the regulatory evaluation discussed in Section 2.0 of this safety evaluation and is, therefore, acceptable to the NRC staff.

The proposed change to TS 3.10.8.f to change "CFD charging water header pressure $\geq$ 940 psig" to "CRD charging water header pressure $\geq$ 940 psig" (i.e., from "CFD" to "CRD," whereby CRD is the acronym for "control rod drive") corrects a typographical error and is, therefore, an administrative change; henceforth, the change is acceptable to the NRC staff.

Based on the above discussion, the NRC staff finds that the proposed TS changes are consistent with the regulatory evaluation discussed in Section 2.0, specifically the requirements in RIS 2006-17, and are acceptable.

3.3 Conclusion – Technical Evaluation

The NRC staff has reviewed the proposed TS change to revise the present AV in TS Table 3.3.5.1-1 Function 3.d, condensate storage tank level - low, from greater than or equal to 36 inches to greater than or equal to 40.50 inches. This TS change will increase the CST level for the HPCI automatic pump suction transfer from the CST to the SP which precludes the vortex formation and air intrusion in the HPCI pump. Overall, this TS change will improve the plant safety. The licensee evaluation complies with 10 CFR 50.36(c)(2) and 10 CFR 50.36 (c)(3) regulatory requirements. Therefore, the NRC staff has concluded that the proposed TS change is acceptable. Furthermore, the NRC staff finds that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in this manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92(c) state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or,

(2) Create the possibility of a new or different kind of accident from any previously evaluated; or,

(3) Involve a significant reduction in a margin of safety.

As required by 10 CFR 50.91(a), in its March 24, 2009, application as supplemented on April 24, and September 11, 2009, the licensee provided the analysis of the issue of no significant hazards consideration. The NRC staff has reviewed the licensee's analysis against the standards of 10 CFR 50.92(c). The NRC staff's review is presented below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   No. The proposed change to TS Table 3.3.5.1-1 increases the Technical Specification allowable value for the HPCI suction low level automatic transfer function from ≥ 3 6 inches to ≥ 40.5 inches above the CST bottom. There are no process setpoint changes associated with this TS allowable value change. This TS change does not introduce the possibility of an increase in the probability or consequences of an accident because the HPCI automatic transfer function is not an initiator of any new accidents nor does it introduce any new failure modes. The CST is not safety related and therefore not credited in any design basis accident analyses. However, the CST reserve volume is credited in anticipated transients without scram (ATWS), Appendix R and station blackout (SBO) evaluations. The reserve volume available in the CST at the proposed allowable value of 40.5 inches above the CST bottom remains adequate to fully support these HPCI system support functions and the change fully supports HPCI system operation. The reserve volume is not reduced as a result of the proposed change in the TS allowable value since the transfer will still occur at the CST low level instrument setpoint of 43.5 inches above tank bottom, which remains unchanged.

The HPCI system automatic transfer function occurs at the point in a design basis accident (DBA) when the CST level reaches the low level transfer setpoint. This proposed change will require the HPCI pump suction to be transferred from the CST to the SP at 40.5 inches versus 36 inches above the CST bottom. Currently, the TS allow this transfer to occur at 36 inches. This proposed change is conservative because it assures the suction transfer will occur while there is more water in the tank, thus eliminating the possibility of vortex formation and air intrusion to the HPCI pump suction. Since this proposed change ensures the HPCI system automatic suction transfer function occurs without adversely impacting HPCI system operation, it does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed editorial administrative change is necessary to correct a typographical error in the SSES Units 1 and 2 TS Section 3.10.8.f. This editorial change does not involve a significant increase in the probability or consequences of an accident previously evaluated

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   No. As discussed above, the proposed change to TS Table 3.3.5.1-1 involves increasing the TS allowable value for the HPCI low level automatic transfer function from the CST to the SP at ≥ 36 inches to ≥ 40.5 inches above the CST tank bottom. This change ensures the HPCI automatic transfer function occurs without introducing the possibility of vortex formation or air intrusion in the HPCI pump suction path. All HPCI system support functions remain unaffected by this change. This TS change does not introduce the possibility of a new accident because the HPCI automatic transfer function is not an initiator of any accident and no new failure modes are introduced. There are no new types of failures or new or different kinds of accidents or transients that could be created by these changes. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed editorial administrative change only corrects a typographical error in the SSES Units 1 and 2 TS Section 3.10.8.f. This editorial change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

No. The margin of safety is established through equipment design, operating parameters, and the setpoints at which automatic actions are initiated. The proposed change to TS Table 3.3.5.1-1 involves increasing the allowable level at which the HPCI automatic suction transfer from the CST to the SP must occur to avoid the possibility of vortex formation or air intrusion into the HPCI pump. This change does not result in a change to the level switch setpoint, which initiates the HPCI suction transfer from the CST to the SP. Although the allowable value for the transfer is now closer to the process setpoint for activation of the level switch, this reduction in operating margin was reviewed and determined to be acceptable. The level switch setpoint tolerances were established based on historical instrument data and instrument characteristics. These tolerances provide adequate margin to the proposed TS allowable value of 40.5 inches above the CST bottom. The tolerances further ensure the transfer will occur prior to level reaching the technical specification allowable value. Therefore, the proposed change does not result in a significant reduction in a margin of safety.

The proposed editorial administrative change only corrects a typographical error in the SSES Units 1 and 2 TS Section 3.10.8.f. This editorial change does not result in a significant reduction in a margin of safety.

Based on the above discussion, it appears that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that the amendment request involves no significant hazards consideration.

5.0 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.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (74 FR 51332, dated October 6, 2009). The NRC staff has presented its final no significant hazards consideration determination in Section 4.0 of this Safety Evaluation. 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.

7.0 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: S. Mazumdar
K. Desai

Date: November 9, 2009

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

Sincerely,
/ra/
Bhalchandra K. Vaidya, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures:
1. Amendment No. 254 to License No. NPF-14
2. Amendment No. 234 to License No. NPF-22
3. Safety Evaluation

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