July 25, 2005

Mr. Britt T. McKinney
Sr. Vice President and
Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: STANDBY LIQUID CONTROL SYSTEM SURVEILLANCE REQUIREMENT 3.1.7.7 (TAC NOS. MC3305 AND MC3306)

Dear Mr. McKinney:

The Commission has issued the enclosed Amendment No. 221 to Facility Operating License No. NPF-14 and Amendment No. 198 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2 (SSES 1 and 2). These amendments are in response to your application dated May 11, 2004.

The amendments revise the SSES 1 and 2 Technical Specification (TS) Surveillance Requirement 3.1.7.7 acceptance criteria from 1224 pounds per square-inch gauge (psig) to 1395 psig in TS 3.1.7, "Standby Liquid Control System."

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

Sincerely,

/RA/

Richard V. Guzman, 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. 221 to License No. NPF-14
2. Amendment No. 198 to License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

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3. Safety Evaluation

DISTRIBUTION:

PUBLIC	PDI-1 R/F	RLaufer
RGuzman	MO'Brien	OGC
ACRS	GHill (2)	TBoyce
SMiranda	CLiang	JNakoski
BPham	MShanbaky	KPoertner

cc w/encls: See next page

* SE provided by memo. No substantive changes made.
Accession No.: ML051780240 Package No.: TSs:

OFFICE	PDI-1/PM	PDI-2/LA	SRXB/SC*	OGC	PDI-1/SC
NAME	RGuzman	MO'Brien	CLiang	JHull	RLaufer
DATE	7/11/05	7/11/05	3/21/05	7/20/05	7/21/05

OFFICIAL RECORD COPY

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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. 221
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 May 11, 2004, 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. 221 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: July 25, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 221

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
TS/3.1-22	TS/3.1-22

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 198
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 PPL Susquehanna, LLC, dated May 11, 2004, 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. 198 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: July 25, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 198

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
TS/3.1-22	TS/3.1-22

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 221 TO FACILITY OPERATING LICENSE NO. NPF-14

AND AMENDMENT NO. 198 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 May 11, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML041420069), 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 proposed changes would revise the SSES 1 and 2 TS Surveillance Requirement (SR) 3.1.7.7 to raise the standby liquid control (SLC) pump discharge pressure acceptance criterion from 1224 pounds per square-inch gauge (psig) to 1395 psig.

2.0 REGULATORY EVALUATION

The Nuclear Regulatory Commission (NRC) finds that PPL, in its May 11, 2004, submittal, identified the applicable regulatory requirements. The regulatory requirements and guidance which the NRC staff considered in its review of the application are as follows:

1. Title 10 of the *Code of Federal Regulations* (10 CFR) establishes the fundamental regulatory requirements with respect to the reactivity control systems. Specifically, General Design Criterion (GDC)-26, “Reactivity control system redundancy and capability,” in Appendix A to Part 50, "General Design Criteria for Nuclear Power Plants," states, in part, that two independent reactivity control systems of different design principles shall be provided, and that one of the systems be capable of holding the reactor core subcritical under cold conditions.

2. GDC-27, “Combined reactivity control systems capability,” states that the reactivity control system shall be designed to have a combined capability, in conjunction with poison addition by the emergency core cooling system, of reliably controlling reactivity changes to assure that under postulated accident conditions and with appropriate margin for stuck rods the capability to cool the core is maintained.

3. Section 50.62, “Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants,” states, in part, that each boiling-water reactor must have a Standby Liquid Control (SLC) system with the capability of injecting into the reactor pressure vessel a borated water solution at such a flow rate, level of boron concentration and boron-10 isotope enrichment, and accounting for reactor pressure vessel volume, that the resulting reactivity control is at least equivalent to that resulting from injection of 86 gallons per minute of 13 weight percent sodium pentaborate decahydrate solution.

4. Generic Letter (GL) 85-03, "Clarification of Equivalent Control Capacity for Standby Liquid Control Systems," dated January 28, 1985, provided guidance on allowing flexibility in the implementation of the anticipated transient without scram (ATWS) Rule.

3.0 TECHNICAL EVALUATION

3.1 Background

The SLC system provides a backup capability for bringing the reactor from full power to a cold, Xenon-free shutdown assuming that none of the withdrawn control rods can be inserted. The SLC system injects a boron solution into the Reactor Pressure Vessel (RPV), which shuts down the core. The SLC system is an independent, diverse backup system to the control rod drive system. The SLC system consists of two redundant pumps and isolation valves. Each pump is capable of providing 100 percent of the flow required to bring the plant from maximum rated power to cold shutdown conditions.

The SLC system was originally classified by General Electric (GE) Company as a "Special Capability System" (a subset of the non-safety-related classification), designed with the ability to shutdown the reactor and bring it to the cold shutdown condition independent of the control rods. Since the SLC system is not required to respond to and mitigate the consequences of a design-basis accident, the system is not required to meet all safety design-basis requirements of engineered safety feature systems. However, in order for the system to have a high degree of reliability, the system was designed with many safety-related system features (e.g., components required for injection are designed to safety-related criteria).

The NRC staff’s review covered the functional capability of the system to deliver the required amount of boron solution into the reactor. The NRC’s acceptance criteria are based on (1) GDC-26, insofar as it requires that two independent reactivity control systems of different design principles be provided, and that one of the systems be capable of holding the reactor subcritical in the cold condition; (2) GDC-27, insofar as it requires that the reactivity control systems have a combined capability, in conjunction with poison addition by the emergency core cooling system, to reliably control reactivity changes under postulated accident conditions; and (3) 10 CFR 50.62(c)(4), insofar as it requires that the SLC system be capable of reliably injecting a borated water solution into the reactor pressure vessel at a boron concentration, boron enrichment, and flow rate that provides a set level of reactivity control. Specific review criteria are contained in Standard Review Plan, Section 9.3.5 (Reference 3).

3.2 PPL's proposed change

PPL proposes the following change to the SLC pump discharge pressure specified in the Susquehanna TS SR 3.1.7.7:

> Verify each pump develops a flow rate $ 41.2 gpm [gallons per minute] at a discharge pressure $ 1395 psig.

This change in pump discharge pressure establishes the functional requirements for assessing SLC pump operability under ATWS conditions in the SSES 1 and 2 TSs.

PPL also proposes the following change in the SSES TS Bases Section SR 3.1.7.7, to support the new SLC pump discharge pressure in order to comply with the ATWS Rule 10 CFR 50.62, as follows:

> Demonstrating that each SLC System pump develops a flow rate $ 41.2 gpm at a discharge pressure $1395 psig without actuating the pump's relief valve ensures that pump performance has not degraded during the fuel cycle. Testing at 1395 psig assures that the functional capability of the SLC System meets the ATWS Rule (10 CFR 50.62) (Reference 1)[1] requirements. This minimum pump flow rate requirement ensures that, when combined with the sodium pentaborate solution concentration requirements, the rate of negative reactivity insertion from the SLC System will adequately compensate for the positive reactivity effects encountered during power reduction, cooldown of the moderator, and xenon decay. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this Surveillance is in accordance with the Inservice Testing Program.

PPL maintains that the 10 CFR 50.62 requirement (i.e., delivery of 86 gpm of 13 weight percent of sodium pentaborate) is satisfied by the simultaneous operation of two SLC pumps, each with a capacity of 41.2 gpm, and delivering water with a sodium pentaborate concentration of 13.6 weight percent (Reference 4). This is consistent with the ATWS Rule and GL 85-03, "Clarification of Equivalent Control Capacity for Standby Liquid Control Systems," dated January 28, 1985.

The proposed SLC pump discharge pressure, 1395 psig, is the sum of the RPV Dome Pressure, 1195 psig, which corresponds to the second main steam safety relief valve spring setpoint, the RPV static head, 8 psig, a core delta-pressure of 6 psig, and the friction losses, 186 psig, in the two-pump SLC system.

The SLC system friction losses were determined by measuring actual system line losses during two-pump SLC system operation (82.4 gpm). Since these friction losses are greater than the

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[1] Reference 1 alludes to a reference in the TS Bases, not in this evaluation report.

friction losses for single pump operation, they are conservative and acceptable for use in establishing the discharge pressure requirements and test pressure in the surveillance requirements. Therefore, the maximum injection pressure is determined for the purpose of complying with the ATWS Rule (10 CFR 50.62).

The proposed change to SR 3.1.7.7 would make the SR acceptance criteria coincide with the current inservice testing (IST) program acceptance criteria (i.e., the acceptance criteria for TS Section 5.5.6 IST program requirements include an SLC system pump discharge pressure $1395 psig). Thus, the proposed change to SR 3.1.7.7 reflects the current practice of testing the SLC system pumps to demonstrate their capability to deliver the required flow (41.2 gpm each) at a pump discharge pressure derived from the maximum ATWS pressure, 1395 psig.

The SLC system was modified to preserve margin, increase the SLC pump discharge piping design pressure, and to raise the pump discharge relief valve setpoint to 1500 psi. Therefore, there is a 105 psi margin between the maximum required pump discharge pressure and the relief valve setpoint. This 105 psi margin is greater than the original GE design requirement of 75 psig.

3.3 Conclusion

The NRC staff has reviewed PPL's proposed TS changes, and concludes that PPL has adequately addressed the requirements of 10 CFR 50.62(c)(4). The SLC system will continue to provide the function of reactivity control independent of the control rod system following implementation of the proposed TS changes. Therefore, the NRC staff finds the proposed TS changes acceptable with respect to the SLC system.

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 (69 FR 22882). 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.

7.0 REFERENCES

1. B.L. Shriver, PPL, letter to U.S. NRC, "Susquehanna Steam Electric Station, Proposed Amendment No. 264 to License NFP-14, and Proposed Amendment No. 229 to License NFP-22: Resolution of URI 2001-04-03, Standby Liquid Control/ATWS PLA-5739," May 11, 2004 (ML041420069).

2. L.B. Marsh, NRC, to R.A. Blough, NRC, "Response to Task Interface Agreement - TIA 2001-12 Regarding Susquehanna Steam Electric Station (SSES), Units 1 and 2, Design and Licensing Bases for the Standby Liquid Control System," May 6, 2002 (ML020570514).

3. NUREG-0800, "Standard Review Plan," Draft Revision, April 1996.

4. NEDE-31096-P, "Licensing Topical Report: Anticipated Transients Without SCRAM Response to NRC ATWS Rule, 10 CFR 50.62," General Electric (proprietary).

Principal Contributors: S. Miranda
K. Poertner

Date: July 25, 2005