

September 28, 2006

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  
AMENDMENT RE: DC ELECTRICAL POWER SYSTEMS TECHNICAL  
SPECIFICATION TASK FORCE (TSTF) 360 (TAC NOS. MC5153 AND MC5154)

Dear Mr. McKinney:

The Commission has issued the enclosed Amendment No. 238 to Facility Operating License No. NPF-14 and Amendment No. 215 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 November 9, 2004, as supplemented by letters dated December 15, 2005, June 30, 2006, August 18, 2006, and September 28, 2006.

These amendments revise the SSES 1 and 2 TSs 3.8.4, "DC Sources-Operating," 3.8.5, "DC Sources-Shutdown," 3.8.6, "Battery Cell Parameters," and add a new TS Section, 5.5.13, "Battery Monitoring and Maintenance Program." These changes are consistent with TSTF-360, Revision 1.

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,

*/RA/*

Richard V. Guzman, 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. 238 to License No. NPF-14
2. Amendment No. 215 to License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

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These amendments revise the SSES 1 and 2 TSs 3.8.4, "DC Sources-Operating," 3.8.5, "DC Sources-Shutdown," 3.8.6, "Battery Cell Parameters," and add a new TS Section, 5.5.13, "Battery Monitoring and Maintenance Program." These changes are consistent with TSTF-360, Revision 1.

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DISTRIBUTION:

PUBLIC	RidsNrrDorLpl1-1	RidsNrrPMRGuzman	RidsNrrDeEeeb
LPLI-1/R/F	RidsNrrDirsltsb	RidsNrrLASLittle	RidsOGC Rp
Ghill (4)	RidsAcrcsAcnwMailCenter		

ADAMS Accession Number: ML062580237 \* SE inputs provided by memo. No substantive changes made.

OFFICE	LPLI-1/PE	LPLI-1/PM	LPLI-1/LA	EEEB/BC	OGC	LPLI-1/BC
NAME	NMorgan	RGuzman	SLittle	GWilson*	JMartin	RLaufer
DATE	9/15/06	9/15/06	9/27/06	8/31/2006	9/26/06	9/28/06

**OFFICIAL RECORD COPY**

PPL SUSQUEHANNA, LLC  
ALLEGHENY ELECTRIC COOPERATIVE, INC.  
DOCKET NO. 50-387  
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 238  
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 November 9, 2004, as supplemented on December 15, 2005, June 30, August 18, and September 28, 2006, 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. 238 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 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Richard J. Laufer, 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: September 28, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 238

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

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

REMOVE  
3

INSERT  
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  
TS/3.8-24  
TS/3.8-25  
TS/3.8-26  
TS/3.8-27  
TS/3.8-28  
TS/3.8-31  
TS/3.8-32  
TS/3.8-33  
TS/3.8-34  
TS/3.8-35  
TS/3.8-36  
-

INSERT  
TS/3.8-24  
TS/3.8-25  
TS/3.8-26  
TS/3.8-27  
TS/3.8-28  
TS/3.8-31  
TS/3.8-32  
TS/3.8-33  
TS/3.8-34  
TS/3.8-35  
TS/3.8-36  
TS/5.0-18A

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 215  
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 November 9, 2004, as supplemented on December 15, 2005, June 30, August 18, and September 28, 2006, 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. 215 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 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Richard J. Laufer, 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: September 28, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 215

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

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

REMOVE  
3

INSERT  
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  
TS/3.8-28  
TS/3.8-29  
TS/3.8-30  
TS/3.8-31  
TS/3.8-32  
TS/3.8-33  
TS/3.8-38  
TS/3.8-39  
TS/3.8-40  
TS/3.8-41  
TS/3.8-42  
TS/3.8-43

-

INSERT  
TS/3.8-28  
TS/3.8-29  
TS/3.8-30  
TS/3.8-31  
TS/3.8-32  
TS/3.8-33  
TS/3.8-38  
TS/3.8-39  
TS/3.8-40  
TS/3.8-41  
TS/3.8-42  
TS/3.8-43  
TS/5.0-18A

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 238 TO FACILITY OPERATING LICENSE NO. NPF-14  
AND AMENDMENT NO. 215 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 letter dated November 9, 2004, Agencywide Documents Access and Management System (ADAMS) Accession No. ML043270480, as supplemented by letters dated December 15, 2005 (ADAMS Accession No. ML053630270), June 30, 2006 (ADAMS Accession No. ML061930137), August 18, 2006 (ADAMS Accession No. ML062410509), and September 28, 2006, 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 TSs 3.8.4, "DC Sources-Operating," 3.8.5, "DC Sources-Shutdown," 3.8.6, "Battery Cell Parameters," and add a new TS Section, 5.5.13, "Battery Monitoring and Maintenance Program." These changes would be consistent with TS Task Force (TSTF) 360, Revision 1.

The supplemental letters dated December 15, 2005, June 30, August 18, and September 27, 2006, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on January 17, 2006 (71 FR 2596).

2.0 REGULATORY EVALUATION

The following NRC requirements and guidance document are applicable to the NRC staff's review of PPL's amendment request.

Title 10 of the *Code of Federal Regulations* (10 CFR) Appendix A of Part 50, General Design Criterion (GDC) 17, "Electric power systems," requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions.

In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC 18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

10 CFR 50.63, "Loss of all alternating current power," requires that each light-water cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout.

10 CFR 50.36, "Technical specifications," requires a licensee's TSs to establish limiting conditions for operation (LCOs), which include Completion Times (CTs) for equipment that is required for safe operation of the facility.

10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," requires that preventive maintenance activities must not reduce the overall availability of the systems, structures, and components.

Regulatory Guide (RG) 1.32, "Criteria For Safety-Related Electric Power Systems For Nuclear Power Plants," provides guidance for complying with GDC 17 and 18 with respect to design, operation, and testing of safety-related electric power systems of all types of nuclear power plants.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Design of SSES 1 and 2, Direct Current (DC) Electrical Power System

At SSES 1 and 2, the Class 1E DC power system for each unit consists of four 125 volt (V) DC subsystems, two 250 V DC subsystems, and two +/- 24 V DC subsystems. Additionally, the Diesel Generator E building has a 125 V DC subsystem.

The four 125 V DC subsystems are identified as channels A, B, C, and D. Each subsystem provides the control power for its associated Class 1E alternating current (AC) power load group channel: 4.16 kV switchgear, 480 V load centers, and standby diesel generator. These DC subsystems also provide DC power to the engineered safety feature valve actuation, diesel generator auxiliaries, and plant alarm and indication circuits.

Each 125 V DC subsystem consists of one load center, one Class 1E and one non-Class 1E distribution panel, one 125 V battery bank, and one battery charger. The non-Class 1E distribution panel is connected to the Class 1E DC power supply through an isolation system. The battery charger of each system is supplied with 480 V Class 1E AC power from the motor control center associated with the same load group channel. One spare 125 V battery charger is provided for both generating units.

The Diesel Generator E 125 V DC subsystem is identified as Channel H and provides DC power to emergency service water valves, control power to Class 1E 4.16 kV switchgear, and the standby diesel generator in the Diesel Generator E building.

The Diesel Generator E 125 V DC subsystem consists of one switchboard, one motor control center, one non-Class 1E distribution panel, one 125 V battery bank, and one battery charger. The non-Class 1E distribution panel is isolated from the Class 1E DC power supply by an isolation system. The battery charger is supplied from a 480 V Class 1E motor control center in the Diesel Generator E building.

The two Class 1E 250 V DC subsystems are identified as Divisions I and II. The 250 V DC subsystems supply the DC power required for larger loads such as DC motor driven pumps and valves, inverters for the plant computer, and vital 120 V AC power supplies.

The Division I 250 V DC subsystem is provided with one 250 V battery bank, one load center, two equal capacity chargers, and motor control centers. The Division II 250 V DC subsystem is provided with one 250 V battery bank, one distribution load center, one battery charger, and motor control centers. The 250 V DC battery chargers are supplied by 480 V Class 1E AC motor control centers. One spare 250 V battery charger is provided for both units.

### 3.2 Evaluation of Proposed Changes

In its letter dated November 9, 2004, PPL proposed a license amendment to the TSs for SSES 1 and 2, using TSTF-360, Revision 1. The proposed changes would revise LCO 3.8.4, "DC Sources-Operating," LCO 3.8.5, "DC Sources-Shutdown," and LCO 3.8.6, "Battery Cell Parameters," and add a new TS section 5.5.13, "Battery Monitoring and Maintenance Program."

The NRC staff reviewed and evaluated each of the proposed changes to the SSES 1 and 2, TSs as follows:

#### 3.2.1 LCO 3.8.4 Changes

##### 3.2.1.1 LCO 3.8.4 Change (1): PPL proposed the following:

The existing Condition A, associated Required Actions and CTs will be deleted and replaced with the following new Conditions:

- A new Condition A, associated Required Actions and CTs for one or more battery chargers on one subsystem inoperable.
- New Required Action A.1 would require restoring battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours.
- New Required Action A.2 would require verification that battery float current is less than or equal to 2 amps once per 12 hours.
- New Required Action A.3 would require restoring the battery charger(s) to OPERABLE status within 7 days.

#### Evaluation of LCO 3.8.4 Change (1)

An NRC staff review of this change was not necessary as PPL withdrew this change request in its December 15, 2005, supplemental letter.

3.2.1.2 LCO 3.8.4 Change (1A): PPL proposed the following:

Table 3.8.4-1 will be revised by inserting “or” between the Division I battery chargers.

#### Evaluation of LCO 3.8.4 Change (1A)

PPL proposed inserting an ‘or’ statement between the Division I battery chargers due to supporting calculations that show that one Division I 250 V DC battery charger with a rating of 300 amps is sufficient to re-charge the battery to the fully-charged state within 24 hours, following a discharge to the design-basis accident load profile while supplying the largest combined demands of the various continuous steady-state loads. Based on the review of PPL’s supporting calculations, the NRC staff finds this change acceptable as it meets the GDC 17 requirement for sufficient capacity and capability.

3.2.1.3 LCO 3.8.4 Change (2): PPL proposed the following:

Surveillance Requirement (SR) 3.8.4.1 would be revised to replace the terminal voltage criteria with “greater than or equal to the minimum established float voltage.”

#### Evaluation of Proposed LCO 3.8.4 Change (2)

PPL proposed relocating the specific terminal voltage criteria currently identified in SR 3.8.4.1 to the TS Bases. The purpose of SR 3.8.4.1 is to verify the battery terminal voltage while the system is on float charge which helps to ensure the effectiveness of the battery chargers. The battery manufacturer establishes the appropriate battery terminal voltage as the minimum established float voltage to provide optimum charge on the battery. This voltage will maintain the battery plates in a condition that supports maintaining the battery grid life. PPL will define the minimum established float voltage in the SSES 1 and 2 TS Bases. The NRC staff finds that the minimum established float voltage values can be adequately controlled outside of the TSs; therefore, the proposed change to SR 3.8.4.1 is acceptable.

PPL also proposed removing the note regarding surveillance frequency and the 14-day surveillance frequency requirement since verification of battery terminal voltages will be required every 7 days. The NRC staff finds this change to be conservative in nature, and therefore, acceptable.

3.2.1.4 LCO 3.8.4 Change (3): PPL proposed the following:

- Delete SR 3.8.4.2, 3.8.4.3, 3.8.4.4, and 3.8.4.5 from the SSES TSs and relocate these tests to a licensee-controlled program. This change requires renumbering SR 3.8.4.6 as SR 3.8.4.2 and SR 3.8.4.7 as SR 3.8.4.3.

- New SR 3.8.4.2 would be revised to replace the terminal voltage criteria with “greater than or equal to the minimum established float voltage.”

#### Evaluation of Proposed LCO 3.8.4 Change (3)

In accordance with SR 3.0.1, when any SR is not met, the LCO is not met. This is based on the SRs representing the minimum acceptable requirements for operability of the required equipment. However, for SR 3.8.4.2, SR 3.8.4.3, SR 3.8.4.4, and SR 3.8.4.5, failure to meet the SR does not necessarily mean that the equipment is not capable of performing its safety function. Furthermore, the corrective action is generally a routine or preventive maintenance-type activity. These activities are inappropriate for SRs and can be controlled in the maintenance programs for batteries.

With regard to the resistance verifications of SR 3.8.4.2 and SR 3.8.4.5, the values are nominal values and represent values at which some action should be taken, not necessarily when the operability of the battery is in question. The licensee’s safety analyses do not assume a specific battery resistance value, but typically assume the batteries will supply adequate power. Therefore, the key issue is the overall battery resistance. Between surveillances, the resistance of each battery cell connection varies independently from all the others. Some of these connection resistance values may be higher or lower than others, and the battery may still be able to perform its function and should not be considered inoperable. Overall resistance has a direct impact on operability and is adequately determined as acceptable through completion of the battery service and discharge tests. Therefore, these activities are more appropriately controlled under the maintenance program for batteries. Specifically, PPL stated that these surveillances will be addressed by the new Battery Monitoring and Maintenance Program described in proposed TS Section 5.5.13.

SR 3.8.4.2 specifies battery charger current requirements for each DC source, and its purpose is to verify the design capacity of each battery charger. SR 3.8.4.2 requires that each battery charger be capable of supplying greater than or equal to 100 amps for greater than or equal to 4 hours for the 125 V Battery, greater than or equal to 300 amps for the 250 V Battery, and greater than or equal to 200 amps for the 125 V Diesel Generator E Battery. PPL has proposed revising this SR to be consistent with SR 3.8.4.1 by replacing the specific voltage limits with “greater than or equal to the minimum established float voltages.” The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the battery charger voltage level after a response to a loss of AC power. As stated in the NRC staff evaluation of LCO 3.8.4 change (2) above, the battery manufacturer establishes this voltage limit to provide the optimum charge on the battery and to maintain the battery plates in a condition that supports maintaining the battery grid life. Maintaining the battery plates in a condition that supports maintaining the battery grid life provides assurance that the battery will be capable of providing its designed safety function.

Based on the above, the NRC staff concludes that the proposed changes meet the 10 CFR 50.36 requirements, are reasonable, maintain safe conditions, and therefore, are acceptable.

3.2.1.5 LCO 3.8.4 Change (4): PPL proposed the following:

An alternative criteria would be added to the SR that allows the charger operability to be verified by recharging its associated battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.

Evaluation of Proposed LCO 3.8.4 Change (4)

An NRC staff review of this change was not necessary as PPL withdrew this change request in its December 15, 2005, supplemental letter.

3.2.1.6 LCO 3.8.4 Change (5): PPL proposed the following:

Rename SR 3.8.4.7 to SR 3.8.4.3 due to the elimination of SRs 3.8.4.2, 3.8.4.3, 3.8.4.4, 3.8.4.5 and the renaming of SR 3.8.4.6 to SR 3.8.4.2. Additionally, the Note for this SR is clarified to allow credit to be taken for the surveillance, due to unplanned events, to satisfy the new SR 3.8.4.3.

Evaluation of Proposed LCO 3.8.4 Change (5)

The NRC staff finds that renaming SR 3.8.4.7 to SR 3.8.4.3 and SR 3.8.4.6 to SR 3.8.4.2 is administrative in nature, and therefore, acceptable. The NRC staff also concludes that clarifying the note to state that credit may be taken for unplanned events that satisfy the SR is reasonable, maintains safe conditions, and therefore, is acceptable.

3.2.2 LCO 3.8.5 Changes

PPL proposed the following:

Existing SR 3.8.5.1 would be revised to reflect the relocation or elimination of SRs.

Evaluation of Proposed LCO 3.8.5 Change

The NRC staff finds that the proposed changes to SR 3.8.5.1 are administrative in nature, do not change substantive requirements, and therefore, are acceptable.

3.2.3 LCO 3.8.6 Changes

3.2.3.1 LCO 3.8.6 Change (1): PPL proposed the following:

Relocate SR 3.8.4.8 to SR 3.8.6.6. The note for this relocated SR will be modified to state that credit may be taken for unplanned events that satisfy the SR.

### Evaluation of Proposed LCO 3.8.6 Change (1)

The NRC staff finds that relocating SR 3.8.4.8 to SR 3.8.6.6 is administrative in nature as it demonstrates the operability of the battery and is therefore more appropriate to be included in TS Section 3.8.6. The NRC staff also concludes that the addition of the note stating that credit may be taken for unplanned events that satisfy the SR is reasonable, maintains safe conditions, and therefore, is acceptable.

#### 3.2.3.2 LCO 3.8.6 Change (2): PPL proposed the following:

Deletion of the word “cell” from TS 3.8.6, and the LCO statement is revised to delete reference to the specific limits of Table 3.8.6-1. With regard to the specific limits of Table 3.8.6-1, the following limits are relocated to the Battery Monitoring and Maintenance Program specified in new TS Section 5.5.13:

- Category A and B limits for cell voltage and electrolyte level.
- Category C specific value limit for electrolyte level.
- The requirements for specific gravity will be replaced with float current monitoring.

### Evaluation of Proposed LCO 3.8.6 Change (2)

The NRC staff considers deleting the word “Cell” from TS Section 3.8.6 to be an editorial change, and therefore, acceptable. Regarding TS Table 3.8.6-1, the table specifies the battery cell parameter requirements, including electrolyte level, float voltage, and specific gravity. Since PPL proposed to delete Table 3.8.6-1, deleting references to Table 3.8.6-1 are administrative changes and do not change substantive requirements. Therefore, the NRC staff concludes that these changes are acceptable.

The Category A and B values of TS Table 3.8.6-1 represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. The LCO category presented in 10 CFR 50.36 states that LCOs are “the lowest functional capability or performance levels of equipment required for safe operation of the facility.” As such, the Category A and B values for cell voltage and electrolyte level do not reflect the 10 CFR 50.36 criteria for LCOs. It is proposed that these values and the Required Actions associated with restoration be relocated to a licensee-controlled program. In its August 18, 2006, supplemental letter, PPL provided a regulatory commitment to relocate the current battery parameters (i.e., specific gravity, electrolyte level, cell temperature, float voltage, connection resistance, and physical condition) to a new Battery Monitoring and Maintenance Program. This program will be located in the SSES 1 and 2 Technical Requirements Manuals and described in new TS 5.5.13. The NRC staff finds that the licensee’s regulatory commitment provides adequate assurance that the battery parameter values will continue to be controlled at their current level, and actions will be implemented in accordance with PPL’s corrective action program. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65. This relocation will continue to assure the battery is maintained at current levels of performance, and allows the licensed operators to focus on the monitoring of battery parameter degradations.

The Category C specific limiting values of TS Table 3.8.6-1 for the battery electrolyte levels have also been proposed to be relocated to a licensee-controlled program. However, new TS 3.8.6, Conditions C and D, will require the electrolyte temperature (pilot cell only) and level (any battery cell) to be greater than or equal to minimum established design limits. PPL will relocate the electrolyte temperature and level criteria (i.e., the minimum established design limits) to the SSES 1 and 2 TS Bases. Depending on the available excess capacity of the associated battery, the minimum temperature necessary to support operability of the battery can vary. Relocating these values to a licensee-controlled program will provide PPL with added flexibility to monitor and control this limit at values directly related to the battery's ability to perform its assumed function. Therefore, the NRC staff finds these changes acceptable.

PPL proposed replacing the requirements to measure specific gravity with requirements to monitor float current. In its August 18, 2006, supplemental letter, PPL provided a letter from its battery manufacturer, C&D Technologies, which concurred with the use of float current monitoring for the purpose of determining the state-of-charge of the SSES 1 and 2 station batteries. More specifically, the battery manufacturer stated that a float current value of less than 2 amps (TS 3.8.6, Condition B) is both a reliable and an accurate parameter to use to ascertain a state of full charge for the 125 V DC and the 250 V DC SSES 1 and 2 station batteries. The battery manufacturer also stated that the accuracy and reliability of this reading will hold true over the expected life of these batteries (i.e., 20 years). Furthermore, in its August 18, 2006, supplemental letter, PPL stated that the equipment that will be used to monitor float current will have the necessary accuracy and capability to measure electrical currents in the expected range. The NRC staff finds that the concurrence of the battery manufacturer coupled with PPL's statement concerning the accuracy and capability of the float monitoring equipment provides adequate assurance that the deletion of the requirement for specific gravity measurements will not have a significant impact on safety or the ability to accurately determine the operability of the SSES 1 and 2 station batteries.

The proposed changes by PPL listed above ensure the battery parameters (maintenance, testing, and monitoring) are performed in accordance with the "Battery Monitoring and Maintenance Program," as specified in TS Section 5.5.13. The NRC staff finds that the proposed changes are reasonable, maintain safe conditions, and therefore, are acceptable.

### 3.2.3.3 LCO 3.8.6 Change (3): PPL proposed the following:

The existing Condition A, associated Required Actions and CTs will be deleted and replaced with the following new Conditions:

- New Condition A addresses the condition where a battery bank in a specific 125 V DC electric power subsystem or 250 V DC electric power subsystem has one or more battery cells with a float voltage less than 2.07 V.
- New Condition B addresses the condition where a battery bank is found with a float current of greater than 2 Amps.
- New Condition C addresses the condition where a battery bank is found with the electrolyte level in one or more cells to be less than the minimum established design limits.

- New Condition D addresses the condition where a battery bank is found with a pilot cell electrolyte temperature less than the minimum established design limits.
- New Condition E addresses the condition where one or more batteries in redundant 125 V DC or redundant 250 V DC subsystems are found with battery parameters not within established design limits.
- Current Condition B will be renamed as new Condition F. The current Condition B consists of three separate entry conditions. As part of this proposed change, the last two entry conditions will be deleted. The deleted conditions will be replaced with a new condition requiring entry when one battery in a 125 V DC or a 250 V DC subsystem is found with one or more battery cells with a float voltage of less than 2.07 V and float current greater than 2 amps.

### Evaluation of Proposed LCO 3.8.6 Change (3)

PPL proposed adding new TS 3.8.6, Condition A to address what was formerly the Category C limit for float voltage in TS Table 3.8.6-1. This new Condition would be applicable when a battery on one 125 V DC electrical power subsystem or one 250 V DC electrical power subsystem has one or more battery cells with a float voltage less than 2.07 V. Once Condition A has been entered, the battery cell is considered degraded and the Required Actions are to verify: (a) the battery terminal voltage to be greater than or equal to the minimum established float voltage (SR 3.8.4.1), and (b) that each battery's float current is less than or equal to 2 amps (SR 3.8.6.1). The above actions assure that there is still sufficient battery capacity to perform its intended function without considering the battery inoperable. Continued operation up to 24 hours is proposed to allow the restoration of the affected cell(s) voltage to greater than or equal to 2.07 volts. The NRC staff concludes that the 24-hour restoration time is reasonable, maintains safe conditions, and therefore, is acceptable.

PPL proposed adding new TS 3.8.6, Condition B to address battery state-of-charge. This new Condition would be applicable when a battery on one 125 V DC electrical power subsystem or one 250 V DC electrical power subsystem has a float current greater than 2 amps. A float current of greater than 2 amps provides an indication that a partial discharge has occurred. The Required Action is to verify within 2 hours that the battery terminal voltage is greater than or equal to the minimum established float voltage (SR 3.8.4.1), thus confirming battery charger operability. If the terminal voltage is satisfactory and there are no cells with a voltage less than 2.07 V, Required Action B.2 of Condition B assures that within 12 hours the battery will be restored to its fully-charged condition from any discharge that might have occurred due to a temporary loss of the battery charger.

If the terminal voltage is found to be less than the minimum established float voltage, it indicates that the battery charger is either inoperable or is operating in the current limit mode. If the battery charger is operating in the current limit mode for 2 hours, it is an indication that the battery has been substantially discharged and likely cannot perform its required design functions.

If the float voltage is found to be satisfactory, but there are one or more battery cells with float voltage less than 2.07 V, the associated "OR" statement in the revised Condition F of LCO 3.8.6 would be applicable and the battery must be declared inoperable immediately. If float voltage is satisfactory and there are no cells less than 2.07 V, and the out-of-limit float current condition is due to one or more battery cells with low voltage, the battery is not substantially discharged and the 12-hour CT to restore battery float current to within limit is reasonable. The NRC staff concludes that adding new TS 3.8.6, Condition B is reasonable, maintains safe conditions, and therefore, is acceptable.

PPL proposed adding new TS 3.8.6, Condition C to address the level of the electrolyte in a cell. This new Condition would be applicable when a battery on one 125 V DC electrical power subsystem or one 250 V DC electrical power subsystem has one or more cells with electrolyte level less than minimum established design limits. If the level is above the top of the battery plates, but below the minimum limit, the battery still has sufficient capacity to perform its intended safety function and is not considered inoperable. With electrolyte level below the top of the plates, there is a potential for dry-out and plate degradation. New Required Actions C.1 and C.2 (as well as provisions in new TS 5.5.13) restore the electrolyte level, ensure that the cause of the loss of electrolyte level is not due to a leak in the battery casing, and equalize and test battery cells that have been discovered with an electrolyte level below the top of the plates. The NRC staff concludes that these changes are adequate to ensure that minimum electrolyte levels are maintained, and therefore, is acceptable.

PPL proposed adding new TS 3.8.6, Condition D which applies to a battery found with a pilot cell electrolyte temperature less than the minimum established design limit. This new Condition would be applicable when a battery on one 125 V DC electrical power subsystem or one 250 V DC electrical power subsystem has a pilot cell electrolyte temperature less than the minimum established design limits. A low electrolyte temperature limits the current and power available from the battery.

In a letter dated May 31, 2006, the NRC staff requested PPL to provide assurance that a battery with a battery pilot cell electrolyte temperature slightly greater than or equal to the minimum established design limit will remain capable of performing its minimum design function. In its June 30, 2006, response to this request for additional information, PPL stated that the design temperature for the SSES, Unit 1 and 2, battery cells is 60 degrees Fahrenheit and that the impact of a single cell temperature being slightly above or below the average does not in itself affect the battery's ability to perform its design function. PPL further stated that each SSES battery is sized with correction factors that include temperature and aging.

Since batteries have very large thermal inertia and the SSES, Unit 1 and 2, battery room temperature remains relatively constant at approximately 70 degrees Fahrenheit, the NRC staff concludes that the pilot cell temperature is an accurate representation of the temperature of the entire battery bank. Therefore, the 12-hour CT provides a reasonable time to restore the electrolyte temperature within established limits. The NRC staff concludes that these changes are adequate to ensure that the minimum electrolyte temperature is maintained, and therefore, are acceptable.

PPL proposed adding new TS 3.8.6, Condition E to address the condition where one or more batteries in redundant 125 V DC or redundant 250 V DC subsystems are found with battery parameters not within established design limits. If this condition exists, there is not sufficient

assurance that the batteries will be capable of performing their intended safety function. With redundant batteries involved, loss of function is possible for multiple systems that depend upon the batteries. PPL proposed that battery parameters on one subsystem be restored to within limits within 2 hours. The NRC staff finds that this change is reasonable, maintains safe conditions, and therefore, is acceptable.

PPL proposed adding new TS 3.8.6, Condition F to provide a default condition for one or more batteries with battery parameters outside the allowance of the Required Action for Condition A, B, C, D, or E. Under this condition, it is assumed that there is not sufficient capacity to supply the maximum expected load requirements. New Condition F also addresses the case where one battery on one 125 V DC electrical power subsystem or one 250 V DC electrical power subsystem has one or more cells with a float voltage less than 2.07 V and float current greater than 2 amps. The NRC staff concludes that this change is reasonable, maintains safe conditions, and therefore, is acceptable.

3.2.3.4 LCO 3.8.6 Change (4): PPL proposed the following:

The existing SRs and TS Table 3.8.6-1 would be deleted and replaced with SR 3.8.6.1 for float current, SR 3.8.6.2 for pilot cell voltage, SR 3.8.6.3 for electrolyte level, SR 3.8.6.4 for pilot cell temperature, and SR 3.8.6.5 for connected cell voltage.

#### Evaluation of Proposed LCO 3.8.6 Change (4)

PPL proposed adding new SR 3.8.6.1 which will require verification that the float current for each battery is less than or equal to 2 amps every 7 days. The purpose of this SR is to determine the state-of-charge of the battery. Float charge is the condition in which the battery charger is supplying the continuous small amount of current (i.e., less than 2 amps) required to overcome the internal losses of a battery to maintain the battery in a fully charged state. The float current requirements are based on the float current indicative of a charged battery. As stated in the NRC staff evaluation of LCO 3.8.6 change (2) above, the use of float current to determine the state-of-charge of the battery is consistent with SSES's battery manufacturer. The NRC staff concludes that this change is reasonable, maintains safe conditions, and therefore, is acceptable.

PPL proposed adding new SR 3.8.6.2 and SR 3.8.6.5 which will require verification that the float voltage of pilot cells and all connected cells are greater than or equal to 2.07 volts every 31 and 92 days, respectively. This voltage level represents the point where battery operability is in question. The Battery Monitoring and Maintenance Program under new TS Section 5.5.13 will include actions to restore battery cells with float voltage less than 2.13 V and actions to verify that the remaining cells are greater than or equal to 2.07 V when a cell or cells have been found to be less than 2.13 V. The NRC staff concludes that these changes are reasonable, maintain safe conditions, and therefore, are acceptable.

PPL proposed adding SR 3.8.6.3 which will require verification that connected cell electrolyte level of each battery is greater than or equal to the minimum established design limits every 31 days. Operation of the batteries at electrolyte levels greater than the minimum established design limit ensures that the battery plates do not suffer physical damage and continue to maintain adequate electron transfer capability. The NRC staff concludes that this change is adequate to ensure that minimum electrolyte levels are maintained, and therefore, is acceptable.

PPL proposed adding SR 3.8.6.4 which will require verification that the temperature of each battery pilot cell is greater than or equal to the minimum established design limits every 31 days. Since batteries have very large thermal inertia and the SSES, Unit 1 and 2, battery room temperature remains relatively constant at approximately 70 degrees Fahrenheit, the NRC staff concludes that the pilot cell temperature is an accurate representation of the temperature of the entire battery bank. The NRC staff concludes that this change is adequate to ensure that the minimum electrolyte temperature is maintained, and therefore, is acceptable.

The NRC staff's review of PPL's proposed addition of new SR 3.8.6.6 can be found in Section 3.2.3.1 of this safety evaluation report.

3.2.3.5 LCO 3.8.6 Change (5): PPL proposed the following:

A new program, the Battery Monitoring and Maintenance Program, to be specified in new TS Section 5.5.13, will be created.

This program will have elements relocated from the different affected TSs. The program will be covered in the TSs as follows:

#### 5.5.13 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, which includes the following:

- a. Actions to restore battery cells with float voltage < 2.13 V;
- b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit; and
- c. Actions to verify that the remaining cells are  $\geq 2.07$  V when a cell or cells have been found to be < 2.13 V.

#### Evaluation of Proposed LCO 3.8.6 Change (5)

PPL proposed adding a new program, the Battery Monitoring and Maintenance Program, to be specified in new TS Section 5.5.13. As mentioned earlier, PPL provided a regulatory commitment in its August 18, 2006, supplemental letter, to relocate the current battery parameters (i.e., specific gravity, electrolyte level, cell temperature, float voltage, connection resistance, and physical condition) to a new Battery Monitoring and Maintenance Program. This program will be located in the SSES 1 and 2 Technical Requirements Manuals. The NRC staff finds that the licensee's regulatory commitment provides adequate assurance that the battery parameter values will continue to be controlled at their current level, and actions will be implemented in accordance with PPL's corrective action program. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65. The NRC staff concludes that this change will continue to assure the battery is maintained at current levels of performance, and allows the licensed operators to focus on the monitoring of battery parameter degradations, and therefore, is acceptable.

### 3.3 NRC Staff Conclusion

Based on the above evaluation, the NRC staff finds the proposed revisions to the SSES 1 and 2 TSs are reasonable and are designed to maintain battery parameters within their acceptable limits. The proposed changes continue to ensure the availability of the required DC power to shut down the reactor and to maintain the reactor in a safe condition after an anticipated operational occurrence or a postulated design basis accident. Therefore, the NRC staff finds the proposed changes acceptable.

### 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 changes SRs. 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 (71 FR 2596). 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 Contributor: Matthew McConnell

Date: September 28, 2006