

April 6, 2006

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

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: ELIMINATION OF REQUIREMENTS FOR HYDROGEN RECOMBINERS AND HYDROGEN/OXYGEN MONITORS (TAC NOS. MC8642 AND MC8643)

Dear Mr. McKinney:

The Commission has issued the enclosed Amendment No. 234 to Facility Operating License No. NPF-14 and Amendment No. 211 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated October 5, 2005, as supplemented by letter dated March 31, 2006.

These amendments revise the TSs by eliminating the requirements associated with hydrogen recombiners, and hydrogen and oxygen monitors. A notice of availability for this TS improvement using the consolidated line item improvement process was published in the *Federal Register* on September 25, 2003 (68 FR 55416).

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
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. 234 to
License No. NPF-14
2. Amendment No. 211 to
License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

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

Amendment No. 234
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 October 5, 2005, as supplemented on March 31, 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. 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 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 Technical
Specifications

Date of Issuance: April 6, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 234

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

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

REMOVE

TS/TOC-1
TS/TOC-2
TS/TOC-3
3.3-24
3.3-25
TS/3.6-30
TS/3.6-31

INSERT

TS/TOC-1
TS/TOC-2
TS/TOC-3
TS/3.3-24
TS/3.3-25
TS/3.6-30
TS/3.6-31

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 211

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 October 5, 2005, as supplemented on March 31, 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. 211 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 Technical
Specifications

Date of Issuance: April 6, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 211

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

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

REMOVE

TS/TOC-1
TS/TOC-2
TS/TOC-3
3.3-25
3.3-26
TS/3.6-30
TS/3.6-31

INSERT

TS/TOC-1
TS/TOC-2
TS/TOC-3
TS/3.3-25
TS/3.3-26
TS/3.6-30
TS/3.6-31

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 234 TO FACILITY OPERATING LICENSE NO. NPF-14
AND AMENDMENT NO. 211 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 October 5, 2005 (see Agencywide Document Access and Management System Accession No. ML052850297), as supplemented by letter dated March 31, 2006, 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 supplement dated March 31, 2006, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination.

The proposed changes delete the TS requirements associated with the hydrogen recombiners, and hydrogen and oxygen monitors.

The Nuclear Regulatory Commission (NRC) has revised Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.44, "Standards for combustible gas control system in light-water-cooled power reactors." The amended standards eliminated the requirements for hydrogen recombiners and relaxed the requirements for hydrogen and oxygen monitoring. In letters dated December 17, 2002, and May 12, 2003, the Nuclear Energy Institute (NEI) Technical Specification Task Force (TSTF) proposed to remove requirements for hydrogen recombiners and hydrogen and oxygen monitors from the standard technical specifications (STS) (NUREGs 1430 - 1434) on behalf of the industry to incorporate the amended standards. This proposed change is designated TSTF-447.

The NRC staff prepared this model safety evaluation (SE) for the elimination of requirements regarding containment hydrogen recombiners and the removal of requirements from TSs for containment hydrogen and oxygen monitors and solicited public comment (67 FR 50374, published August 2, 2002) in accordance with the Consolidated Line Item Improvement Process (CLIP). The use of the CLIP in this matter is intended to help the NRC efficiently process amendments that propose to remove the hydrogen recombiner and hydrogen and oxygen monitor requirements from TSs. Licensees of nuclear power reactors to which this model

applies were informed (68 FR 55416; September 25, 2003) that they could request amendments conforming to the model and, in such requests, should confirm the applicability of the SE to their reactors and provide the requested plant-specific verifications and commitments.

2.0 BACKGROUND

Regulatory Issue Summary (RIS) 2000-06, "Consolidated Line Item Improvement Process for Adopting Standard Technical Specification Changes for Power Reactors," was issued on March 20, 2000. The CLIIP is intended to improve the efficiency of NRC licensing processes. This is accomplished by processing proposed changes to the STS in a manner that supports subsequent license amendment applications. The CLIIP includes an opportunity for the public to comment on proposed changes to the STS following a preliminary assessment by the NRC staff and finding that the change will likely be offered for adoption by licensees. The NRC staff evaluates any comments received for a proposed change to the STS and either reconsiders the change or proceeds with announcing the availability of the change for proposed adoption by licensees. Those licensees opting to apply for the subject change to TSs are responsible for reviewing the staff's evaluation, referencing the applicable technical justifications, and providing any necessary plant-specific information. Each amendment application made in response to the notice of availability would be processed and noticed in accordance with applicable rules and NRC procedures.

The Commission's regulatory requirements related to the content of TSs are set forth in 10 CFR 50.36. This regulation requires that the TSs include items in five specific categories. These categories include: 1) safety limits, limiting safety system settings and limiting control settings, 2) limiting conditions for operation (LCOs), 3) surveillance requirements (SRs), 4) design features, and 5) administrative controls. However, the regulation does not specify the particular TSs to be included in a plant's license.

Additionally, 10 CFR 50.36(c)(2)(ii) sets forth four criteria to be used in determining whether an LCO is required to be included in the TSs. These criteria are as follows:

1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that assumes either the failure of or presents a challenge to the integrity of a fission product barrier.
3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
4. A structure, system or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Existing LCOs and related surveillances included as TS requirements which satisfy any of the criteria stated above must be retained in the TSs. Those TS requirements which do not satisfy these criteria may be relocated to other licensee-controlled documents.

As part of the rulemaking that revised 10 CFR 50.44, "Combustible gas control for nuclear power reactors," the Commission retained requirements for ensuring a mixed atmosphere, inerting Mark I and II containments, and providing hydrogen control systems capable of accommodating an amount of hydrogen generated from a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel region in Mark III and ice condenser containments. The Commission eliminated the design-basis loss-of-coolant accident (LOCA) hydrogen release from 10 CFR 50.44 and consolidated the requirements for hydrogen and oxygen monitoring to 10 CFR 50.44 while relaxing safety classifications and licensee commitments to certain design and qualification criteria. The Commission also relocated, without change, the hydrogen control requirements in 10 CFR 50.34(f) to 10 CFR 50.44 and the high point vent requirements from 10 CFR 50.44 to 10 CFR 50.46a.

3.0 EVALUATION

The ways in which the requirements and recommendations for combustible gas control were incorporated into the licensing bases of commercial nuclear power plants varied as a function of when plants were licensed. Plants that were operating at the time of the Three Mile Island (TMI), Unit 2 accident are likely to have been the subject of confirmatory orders that imposed the combustible gas control functions described in NUREG-0737, "Clarification of TMI Action Plan Requirements," as obligations. The issuance of plant-specific amendments to adopt these changes, which would remove hydrogen recombiner and hydrogen and oxygen monitoring controls from TSs, supersede the combustible gas control specific requirements imposed by post-TMI confirmatory orders.

3.1 Hydrogen Recombiners

The revised 10 CFR 50.44 no longer defines a design-basis LOCA hydrogen release, and eliminates requirements for hydrogen control systems to mitigate such a release. The installation of hydrogen recombiners and/or vent and purge systems required by 10 CFR 50.44(b)(3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release does not contribute to the conditional probability of a large release up to approximately 24 hours after the onset of core damage. In addition, these systems were ineffective at mitigating hydrogen releases from risk-significant beyond design-basis accidents. Therefore, the Commission eliminated the hydrogen release associated with a design-basis LOCA from 10 CFR 50.44 and the associated requirements that necessitated the need for the hydrogen recombiners and the backup hydrogen vent and purge systems. As a result, the NRC staff finds that requirements related to hydrogen recombiners no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TSs and the existing TS requirements may, therefore, be eliminated for all plants.

3.2 Hydrogen Monitoring Equipment

Section 50.44(b)(1) of 10 CFR, the STS, and plant-specific TSs currently contain requirements for monitoring hydrogen. Licensees have also made commitments to design and qualification criteria for hydrogen monitors in Item II.F.1, Attachment 6 of NUREG-0737 and Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident." The hydrogen monitors are

required to assess the degree of core damage during a beyond design-basis accident (DBA) and confirm that random or deliberate ignition has taken place. If an explosive mixture that could threaten containment integrity exists during a beyond DBA, then other severe accident management strategies, such as purging and/or venting, would need to be considered. The hydrogen monitors are needed to implement these severe accident management strategies.

With the elimination of the design-basis LOCA hydrogen release, hydrogen monitors are no longer required to mitigate DBAs and, therefore, the hydrogen monitors do not meet the definition of a safety-related component as defined in 10 CFR 50.2. RG 1.97 recommends classifying the hydrogen monitors as Category 1. RG 1.97, Category 1, is intended for key variables that most directly indicate the accomplishment of a safety function for DBA events and, therefore, are items usually addressed within TSs. As part of the rulemaking to revise 10 CFR 50.44, the Commission found that the hydrogen monitors no longer meet the definition of Category 1 in RG 1.97. The Commission concluded that Category 3, as defined in RG 1.97, is an appropriate categorization for the hydrogen monitors because the monitors are required to diagnose the course of beyond DBAs. Hydrogen monitoring is not the primary means of indicating a significant abnormal degradation of the reactor coolant pressure boundary (RCPB). Section 4 of Attachment 2 to SECY-00-0198, "Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.44 (Combustible Gas Control)," found that the hydrogen monitors were not risk-significant. Therefore, the NRC staff finds that hydrogen monitoring equipment requirements no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TSs and, therefore, may be relocated to other licensee-controlled documents. However, because the monitors are required to diagnose the course of beyond DBAs, each licensee should verify that it has, and make a regulatory commitment to maintain, a hydrogen monitoring system capable of diagnosing beyond DBAs.

The elimination of post-accident sampling system requirements from some plant-specific TSs (and associated CLIP notices) indicated that during the early phases of an accident, safety-grade hydrogen monitors provide an adequate capability for monitoring containment hydrogen concentration. The NRC staff has subsequently concluded that Category 3 hydrogen monitors also provide an adequate capability for monitoring containment hydrogen concentration during the early phases of an accident.

3.3 Oxygen Monitoring Equipment

STTs and plant-specific TSs currently require oxygen monitoring to verify the status of the inert containment. Combustible gases produced by beyond DBAs involving both fuel-cladding oxidation and core-concrete interaction would be risk-significant for plants with Mark I and II containments if not for the inerted containment atmospheres. If an inerted containment was to become de-inerted during a beyond DBA, then other severe accident management strategies, such as purging and venting, would need to be considered. The oxygen monitors are needed to implement these severe accident management strategies. Oxygen concentration also appears extensively in the emergency procedure guidelines/severe accident guidelines of plants with inerted containment atmospheres.

With the elimination of the design-basis LOCA hydrogen release, the oxygen monitors are no longer required to mitigate DBAs and, therefore, the oxygen monitors do not meet the definition of a safety-related component as defined in 10 CFR 50.2. RG 1.97 recommends that, for

inerted containment plants, the oxygen monitors be Category 1 which is intended for key variables that most directly indicate the accomplishment of a safety function for DBA events. As part of the rulemaking to revise 10 CFR 50.44, the Commission found that Category 2¹, as defined in RG 1.97, is an appropriate categorization for the oxygen monitors, because the monitors are required to verify the status of the inert containment. Oxygen monitoring is not the primary means of indicating a significant abnormal degradation of the RCPB. Oxygen monitors have not been shown by a probabilistic risk assessment to be risk-significant. Therefore, the NRC staff finds that oxygen monitoring equipment requirements no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TSs and, therefore, may be relocated to other licensee-controlled documents.

However, for plant designs with an inerted containment, each licensee should verify that it has, and make a regulatory commitment to maintain, an oxygen monitoring system capable of verifying the status of the inert containment. In addition, separate requirements for primary containment oxygen concentration will be retained in TSs for plant designs with an inerted containment. The basis for retention of this requirement in TSs is that it meets Criterion 2 of 10 CFR 50.36(c)(2)(ii) in that it is a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis that either assumes the failure of, or presents a challenge to, the integrity of a fission product barrier. This is based on the fact that calculations typically included in Chapter 6 of Updated Final Safety Analysis Reports (UFSAR) assume that the primary containment is inerted, that is, oxygen concentration < 4.0 volume percent, when a design-basis LOCA occurs.

The deletion of the requirements for the hydrogen recombiner, and hydrogen and oxygen monitors resulted in numbering and formatting changes to other TSs, which were otherwise unaffected by this proposed amendment. The NRC staff has confirmed that the related changes are appropriate and do not affect the technical requirements.

4.0 VERIFICATIONS AND COMMITMENTS

As requested by the staff in the notice of availability for this TS improvement, the licensee has addressed the following plant-specific verifications and commitments:

- 4.1 Each licensee should verify that it has, and make a regulatory commitment to maintain, a hydrogen monitoring system capable of diagnosing beyond DBAs.

The licensee has verified that it has a hydrogen monitoring system capable of diagnosing beyond DBAs. The licensee has committed to maintain the hydrogen monitors within its UFSAR. The licensee will implement this commitment within 60 days of issuance of the amendment.

- 4.2 For plant designs with an inerted containment, each licensee should verify that it has,

¹ While discussing the designation of the oxygen monitors as Category 2, the NRC acknowledged in the final rule (68 FR 54123) that the monitors need not be qualified in accordance with 10 CFR 50.49. The amended rule implements performance-based requirements for hydrogen and oxygen monitors to be functional, reliable, and capable of continuously measuring the appropriate parameter in the beyond DBA environment.

and make a regulatory commitment to maintain, an oxygen monitoring system capable of verifying the status of the inert containment.

The licensee has verified that it has an oxygen monitoring system capable of verifying the status of the inert containment. The licensee has committed to maintain the oxygen monitors within its UFSAR. The licensee will implement this commitment within 60 days of issuance of the amendment.

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitments are provided by the licensee's administrative processes, including its commitment management program. Should the licensee choose to incorporate a regulatory commitment into the emergency plan, UFSAR, or other document with established regulatory controls, the associated regulations would define the appropriate change-control and reporting requirements. The staff has determined that the commitments do not warrant the creation of regulatory requirements which would require prior NRC approval of subsequent changes. The NRC staff has agreed that NEI 99-04, Revision 0, "Guidelines for Managing NRC Commitment Changes," provides reasonable guidance for the control of regulatory commitments made to the NRC staff. (See RIS 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000.) The commitments should be controlled in accordance with the industry guidance or comparable criteria employed by a specific licensee. The staff may choose to verify the implementation and maintenance of these commitments in a future inspection or audit.

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 (71 FR 152; January 3, 2006). 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 Contributor: W. Reckley

Date: April 6, 2006