September 28, 2001

Mr. Robert G. Byram
Senior Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
2 North Ninth Street
Allentown, PA 18101

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT RE: HYDROGEN-OXYGEN ANALYZER CONTAINMENT PENETRATIONS (TAC NOS. MA9798 AND MA9799)

Dear Mr. Byram:

The Commission has issued the enclosed Amendment No. 195 to Facility Operating License No. NPF-14 and Amendment No. 170 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 in response to your application dated August 8, 2000.

These amendments revise the requirements for the containment isolation valves in the hydrogen/oxygen analyzer penetrations. This letter also provides the staff's approval of your associated request to use closed system boundary valves that do not completely meet the guidance described in Standard Review Plan, Section 6.2.4, “Containment Isolation System.”

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

Sincerely,

/RA/

Robert G. Schaaf, 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. 195 to License No. NPF-14
2. Amendment No. 170 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. 195
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 August 8, 2000, 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. 195 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/

Patrick Milano, Acting 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: September 28, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 195

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

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

REMOVE	INSERT
3.6-8	3.6-8
3.6-10	3.6-10
3.6-11	3.6-11

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 170
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 August 8, 2000, 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. 170 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/

Patrick Milano, Acting 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: September 28, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 170

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

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

REMOVE	INSERT
3.6-8	3.6-8
3.6-10	3.6-10
3.6-11	3.6-11

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 195 TO FACILITY OPERATING LICENSE NO. NPF-14

AND AMENDMENT NO. 170 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 50-388

1.0 INTRODUCTION

By letter dated August 8, 2000, PPL Susquehanna, LLC (the licensee), submitted a request for changes to the Susquehanna Steam Electric Station, Units 1 and 2, Technical Specifications (TSs). The requested changes would revise the requirements for the containment isolation valves (CIVs) in the hydrogen/oxygen analyzer penetrations. Due to the unusual containment isolation design for the hydrogen/oxygen analyzer penetrations, the existing Conditions in Limiting Condition for Operation (LCO) 3.6.1.3 do not completely describe the required actions, should an associated CIV become inoperable. The purpose of this change is to provide the required actions associated with the hydrogen/oxygen analyzer penetration CIVs. Also, associated with this change is a request for approval to use closed system boundary valves that do not completely meet the guidance described in Standard Review Plan (SRP), Section 6.2.4, "Containment Isolation System."

2.0 BACKGROUND

The principal proposed change to the TSs is the creation of a new condition under LCO 3.6.1.3 to address the unusual containment isolation features of the hydrogen/oxygen analyzer penetrations. This condition describes the actions to be taken when one or more hydrogen/oxygen analyzer penetrations have one or two CIVs inoperable.

The new condition, which only applies to the hydrogen/oxygen analyzer penetrations, states that, if there are one or more hydrogen/oxygen analyzer penetrations with one or two CIVs inoperable, isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange within 72 hours. Furthermore, the licensee shall verify that the affected penetration flow path is isolated once per 31 days.

The actions are the same as those already identified for CIVs in LCO 3.6.1.3, Condition C, which applies only to penetration flow paths with only one CIV, when that CIV is inoperable. The TS Bases state that Condition C relies upon a closed system as the redundant barrier. Since the containment isolation barriers for the hydrogen/oxygen analyzer penetrations consist of two CIVs and a closed system, the new condition combines the actions associated with a

penetration comprised of two CIVs, with the completion time for a penetration that uses a closed system as a redundant barrier. The use of a 72-hour completion time is based upon the reliability provided by a closed system. The Bases for Condition C state:

> The Completion Time of 72 hours is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of supporting primary containment OPERABILITY during MODES 1, 2, and 3.

Penetrations that do not have a closed system have shorter completion times; the majority of penetrations have a 4-hour completion time.

The other proposed changes to this LCO are editorial changes (i.e., re-labeling of conditions) due to the fact that the new condition is being inserted. This includes adding a statement to Conditions A and B to note that these conditions do not apply to the hydrogen/oxygen analyzer penetrations. Also, since the new condition is being inserted as Condition D, existing Conditions D through G must be re-labeled as E through H. Other editorial changes are being made to the existing conditions to account for the impact of re-labeling the existing conditions.

As part of this change, the licensee has also requested approval to use boundary valves as part of the hydrogen/oxygen analyzer closed system that do not meet all of the guidelines contained in NUREG-75/087, Nuclear Regulatory Commission (NRC) SRP, Section 6.2.4, “Containment Isolation System,” Revision 1, dated September 1975, for closed systems outside primary containment (the latest version of the SRP is NUREG-0800, Section 6.2.4, Revision 2, July 1981, which contains the same guidelines, cited below, as Revision 1). Specifically, the valves between the hydrogen/oxygen analyzer system and post accident sampling system (PASS) are part of the closed system boundary. SRP 6.2.4, paragraph II.3.e. (paragraph II.6.e. in Revision 2) permits the use of a closed piping system outside primary containment as a redundant containment isolation barrier provided the system: (1) has a temperature and pressure rating at least equal to that of the containment; (2) is missile protected; (3) is Seismic Category 1; and (4) is designed in accordance with Safety Class 2. The boundary valves between PASS and the hydrogen/oxygen analyzer system meet all of these provisions with the exception of the electrical power supply for the valves, which is not Class 1E. Consequently, these valves do not meet all of the requirements for Safety Class 2. Therefore, the licensee has requested NRC approval for the use of a non-Class 1E-powered valve in a Class 1E application in order to document an exception to the Final Safety Analysis Report (FSAR) commitments regarding the design of closed systems.

The licensee will also make conforming changes to the TS Bases.

The licensee states that there are various deficiencies with the manner in which the containment boundary for the hydrogen/oxygen analyzer penetrations is described in the TS Bases and the means by which the licensee performed leakage rate testing on the system. Specifically, neither TS Bases Table B3.6.1.3 nor FSAR Tables 6.2-12 and 6.2-22 identified that the hydrogen/oxygen analyzer CIVs are susceptible to a single electrical failure, nor did they indicate that the redundant barrier to the valves was a closed system. Consequently, the licensee was testing the hydrogen/oxygen analyzer system boundary as a system that may contain radioactive fluid following an accident (TS 5.5.2), rather than testing the system to ensure compliance with 10 CFR Part 50, Appendix J, requirements. Furthermore, the licensee did not consider the potential for a single failure to prevent both CIVs from closing or causing

both valves to go open, with regard to deactivating closed CIVs in accordance with the TSs. In order to ensure that a hydrogen/oxygen analyzer CIV remains closed, one must pull the fuse and either detach the wires at the valve or jumper the power side of the solenoid to ground. Licensee Event Report 50-387/00-001-00, dated March 3, 2000, discussed these deficiencies.

There are a total of five, one-inch diameter supply and return lines for each division of the hydrogen/oxygen analyzers. Each of the ten affected lines penetrating primary containment has two CIVs, located just outside primary containment. While two CIVs are provided on each line, a single failure within the electrical power supplies to these valves could result in both valves failing to close or failing to remain closed. Furthermore, this same single failure could simultaneously affect all of the CIVs within a hydrogen/oxygen analyzer division. These valves are designed to be powered from the same electrical division in order to assure that a single failure could not result in the loss of both divisions of hydrogen/oxygen analyzers. The hydrogen/oxygen analyzers are required to monitor the buildup of combustible gases inside primary containment post-accident, so that actions can be taken to mitigate this condition. Consequently, the pressure boundary of the hydrogen/oxygen analyzer system provides the primary containment isolation barrier for these penetrations in the event of a single failure of the hydrogen/oxygen analyzer CIVs. While these CIVs are not redundant to each other electrically, they are redundant to each other mechanically. Thus, if one of the CIVs were to become inoperable mechanically (e.g., mechanical binding), the other CIV would be capable of automatic closure, providing two redundant containment isolation barriers (i.e., the remaining CIV and the closed system).

3.0 EVALUATION

The hydrogen/oxygen analyzer CIVs and associated closed system have two safety functions. First, the CIVs have a safety function to open to permit use of the hydrogen/oxygen analyzer system post-accident to provide the operators with information useful for accident response decision-making, particularly regarding manual actions to be taken to mitigate combustible gas buildup. Second, they have a safety function to close, in order to maintain primary containment integrity post-accident in the event of excessive leakage from the hydrogen/oxygen analyzer system. The hydrogen/oxygen analyzer closed system has a safety function to maintain integrity, which fulfills both the containment integrity and combustible gas monitoring safety functions.

The safety function to monitor combustible gas concentration post-accident is not affected by the proposed changes, since no restrictions are placed upon the CIVs being open unless there is a system breach. If such a condition existed, the capability to monitor combustible gas concentration would be provided by the redundant hydrogen/oxygen analyzer division. This position is commensurate with the current licensing basis of the system, as described in FSAR Sections 6.2.5, 7.5.1b.2, and Table 7.5-3, as well as TS Bases B3.3.3.1.

With the closed system outside containment serving as one containment isolation barrier, the NRC staff finds it to be appropriate to treat the two CIVs in each penetration as, in effect, one valve, for the purposes of the LCO action requirements. Thus, whether one or both of the CIVs are inoperable, the required action is the same. Also, due to the presence of the closed system, 72 hours is an appropriate completion time for the action, consistent with the Bases for Condition C of this TS.

In its submittal, the licensee has provided sufficient information to show that the hydrogen/oxygen analyzer system is intended to be a closed system outside containment. However, the boundary valves between the hydrogen/oxygen analyzer system and PASS do not satisfy all of the guidelines of SRP Section 6.2.4, in that they do not receive Class 1E power, as discussed in the Background section, above.

The hydrogen/oxygen analyzer closed system boundary does not include PASS, since PASS does not fully meet the provisions of SRP Section 6.2.4 (i.e., not Seismic Category 1). The containment boundary for the hydrogen/oxygen analyzer closed system stops at the PASS solenoid valves (SV-1(2)2361, SV-1(2)2365, SV-1(2)2366, SV-1(2)2368, and SV-1(2)2369), which isolate PASS from the hydrogen/oxygen analyzer system piping. These valves also denote the Seismic Category 1 boundary between the hydrogen/oxygen analyzer system and PASS.

The PASS solenoid valves in question are small. They are leakage rate tested as part of the Appendix J test performed on the hydrogen/oxygen analyzer closed system. For one of these valves to have any detrimental effect on safety, both its power supply and the PASS system piping would have to fail. Even then, the effect on safety would be small.

Furthermore, the licensee has performed a risk assessment which indicates that the probability of containment leakage through a PASS solenoid valve during a loss-of-coolant accident is very small (less than 10^{-9}) and significantly less than the probability of two motor-operated CIVs, in series in a penetration, failing to close due to a common-cause failure.

Based on this information, the NRC staff finds that the lack of a Class 1E power supply for the PASS solenoid valves does not significantly decrease safety and is acceptable. Further, the hydrogen/oxygen analyzer system outside of containment may be considered to be a closed system for containment isolation purposes, despite this deviation from the provisions of SRP Section 6.2.4.

Based on the foregoing evaluation, the NRC staff finds that the proposed changes to TS 3.6.1.3 are acceptable. The applicable TS Bases will be updated by the licensee in accordance with TS 5.5.10, "Technical Specifications (TS) Bases Control Program." Marked-up Bases pages were provided for information to reflect the TS Bases changes the licensee intends to implement.

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. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no

significant hazards consideration, and there has been no public comment on such finding (66 FR 31713). Accordingly, the amendments meet 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: J. Pulsipher

Date: September 28, 2001

Mr. Robert G. Byram
Senior Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
2 North Ninth Street
Allentown, PA 18101

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT RE: HYDROGEN-OXYGEN ANALYZER CONTAINMENT PENETRATIONS (TAC NOS. MA9798 AND MA9799)

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

Sincerely,

Robert G. Schaaf, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
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Docket Nos. 50-387 and 50-388

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