December 2, 1991

Docket Nos. 50-387
and 50-388

Mr. Harold W. Keiser
Senior Vice President-Nuclear
Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Dear Mr. Keiser:

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SUBJECT: HPCI LOW PRESSURE SURVEILLANCE TEST ACCEPTANCE CRITERIA, SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (TAC NOS. 81684 AND 81685)

The Commission has issued the enclosed Amendment No. 114 to Facility Operating License No. NPF-14 and Amendment No. 83 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2. These amendments are in response to your letter dated September 4, 1991.

These amendments change Technical Specification 4.5.1.c.2 such that the High Pressure Coolant Injection (HPCI) system is verified to develop a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when measured at the pump discharge centerline when steam is being supplied to the HPCI turbine at 150 ± 15 psig.

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

Sincerely,

/S/

James J. Raleigh, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 114 to License No. NPF-14
2. Amendment No. 83 to License No. NPF-22
3. Safety Evaluation

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

December 2, 1991

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Pennsylvania Power and Light Company
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Dear Mr. Keiser:

SUBJECT: HPCI LOW PRESSURE SURVEILLANCE TEST ACCEPTANCE CRITERIA, SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 (TAC NOS. 81684 AND 81685)

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Sincerely,

James J. Raleigh

James J. Raleigh, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
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cc w/enclosures:
See next page

cc:

Jay Silberg, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street N.W.
Washington, D.C. 20037

Bryan A. Snapp, Esq.
Assistant Corporate Counsel
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. J. M. Kenny
Licensing Group Supervisor
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. Scott Barber
Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P.O. Box 35
Berwick, Pennsylvania 18603-0035

Mr. Thomas M. Gerusky, Director
Bureau of Radiation Protection
Resources
Commonwealth of Pennsylvania
P. O. Box 2063
Harrisburg, Pennsylvania 17120

Mr. Jesse C. Tilton, III
Allegheny Elec. Cooperative, Inc.
212 Locust Street
P.O. Box 1266
Harrisburg, Pennsylvania 17108-1266

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Mr. Harold G. Stanley
Superintendent of Plant
Susquehanna Steam Electric Station
Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. Herbert D. Woodeshick
Special Office of the President
Pennsylvania Power and Light Company
1009 Fowles Avenue
Berwick, Pennsylvania 18603

Mr. Robert G. Byram
Vice President-Nuclear Operations
Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

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

PENNSYLVANIA POWER & LIGHT COMPANY

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-387

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 114
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 the Pennsylvania Power & Light Company, dated September 4, 1991 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. 114 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PP&L shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Charles L. Miller

Charles L. Miller, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 2, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 114

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

Replace the following pages of the Appendix A Technical Specifications with enclosed pages. The revised page is identified by Amendment number and contains vertical lines indicating the area of change. The overleaf page is provided to maintain document completeness.*

REMOVE	INSERT
3/4 5-5	3/4 5-5
3/4 5-5a	3/4 5-5a*

SURVEILLANCE REQUIREMENTS (Continued)

2. For the HPCI system, verifying that the system develops a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when steam is being supplied to the turbine at 150 ± 15 psig.*

3. Performing a CHANNEL CALIBRATION of the CSS header ΔP instrumentation and verifying the setpoint to be ≤ 1 psid.

4. Verifying that the suction for the HPCI system is automatically transferred from the condensate storage tank to the suppression chamber on a condensate storage tank water level - low signal and on a suppression chamber - water level high signal.

5. Performing a CHANNEL CALIBRATION of the condensate transfer pump discharge low pressure alarm instrumentation and verifying the low pressure alarm setpoint to be ≥ 113 psig.

d. For the ADS:

1. At least once per 31 days, performing a CHANNEL FUNCTIONAL TEST of the accumulator backup compressed gas system low pressure alarm system.

2. At least once per 18 months:

a) Performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence, but excluding actual valve actuation.

b) Manually** opening each ADS valve when the reactor steam dome pressure is greater than or equal to 100 psig* and observing that either:
1) The control valve or bypass valve position responds accordingly, or
2) There is a corresponding change in the measured steam flow.

c) Performing a CHANNEL CALIBRATION of the accumulator backup compressed gas system low pressure alarm systems and verifying air alarm setpoint of 2070 ± 35 psig on decreasing pressure.

e. At least every 18 months the following shall be accomplished by any series of sequential, overlapping or total channel steps such that the entire channel is tested:

---

* The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

** ADS solenoid energization shall be used alternating between ADS Division 1 and ADS Division 2.

SURVEILLANCE REQUIREMENTS (Continued)

1. A functional test of the interlocks associated with LPCI and CS pump starts in response to an automatic initiation signal in Unit 1 followed by a "False" automatic initiation signal in Unit 2.

2. A functional test of the interlocks associated with LPCI and CS pump starts in response to an automatic initiation signal in Unit 2 followed by a "False" automatic initiation signal in Unit 1.

3. A functional test of the interlocks associated with LPCI and CS pump starts in response to simultaneous occurrence of an automatic initiation signal in both Unit 1 and Unit 2 and a Loss-of-Offsite-Power condition affecting both Unit 1 and Unit 2.

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

PENNSYLVANIA POWER & LIGHT COMPANY

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 83
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 the Pennsylvania Power & Light Company, dated September 4, 1991 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. 83 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PP&L 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.

FOR THE NUCLEAR REGULATORY COMMISSION

Charles L. Miller

Charles L. Miller, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 2, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 83

FACILITY OPERATING LICENSE NO. NPF-14

DOCKET NO. 50-387

Replace the following pages of the Appendix A Technical Specifications with enclosed pages. The revised page is identified by Amendment number and contains vertical lines indicating the area of change. The overleaf page is provided to maintain document completeness.*

REMOVE	INSERT
3/4 5-5	3/4 5-5
3/4 5-5a	3/4 5-5a*

SURVEILLANCE REQUIREMENTS (Continued)

2.# For the HPCI system, verifying that the system develops a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when steam is being supplied to the turbine at 150 ± 15 psig.*

3. Performing a CHANNEL CALIBRATION of the CSS header ΔP instrumentation and verifying the setpoint to be ≤ 1 psid.

4. Verifying that the suction for the HPCI system is automatically transferred from the condensate storage tank to the suppression chamber on a condensate storage tank water level - low signal and on a suppression chamber - water level high signal.

5. Performing a CHANNEL CALIBRATION of the condensate transfer pump discharge low pressure alarm instrumentation and verifying the low pressure alarm setpoint to be ≥ 113 psig.

d. For the ADS:

1. At least once per 31 days, performing a CHANNEL FUNCTIONAL TEST of the accumulator backup compressed gas system low pressure alarm system.

2. At least once per 18 months:
   a) Performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence, but excluding actual valve actuation.
   b) Manually** opening each ADS valve when the reactor steam dome pressure is greater than or equal to 100 psig* and observing that either:
      1) The control valve or bypass valve position responds accordingly, or
      2) There is a corresponding change in the measured steam flow.

---

* The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

** ADS solenoid energization shall be used alternating between ADS Division 1 and ADS Division 2.

\# For the startup following the Third Refueling and Inspection Outage, this suveillance shall read as follows:

For the HPCI System, verifying that the system develops a flow of at least 4850 gpm against a test line pressure of 600 psig when steam is being supplied to the turbine at 150± psig.*

SURVEILLANCE REQUIREMENTS (Continued)

c) Performing a CHANNEL CALIBRATION of the accumulator backup compressed gas system low pressure alarm systems and verifying air alarm setpoint of 2070 ± 35 psig on decreasing pressure.

e. At least every 18 months the following shall be accomplished by any series of sequential, overlapping or total channel steps such that the entire channel is tested:

1. A functional test of the interlocks associated with LPCI and CS pump starts in response to an automatic initiation signal in Unit 1 followed by a "False" automatic initiation signal in Unit 2.

2. A functional test of the interlocks associated with LPCI and CS pump starts in response to an automatic initiation signal in Unit 2 followed by a "False" automatic initiation signal in Unit 1.

3. A functional test of the interlocks associated with LPCI and CS pump starts in response to simultaneous occurrence of an automatic initiation signal in both Unit 1 and Unit 2 and a Loss-of-Offsite-Power condition affecting both Unit 1 and Unit 2.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 114 TO FACILITY OPERATING LICENSE NO. NPF-14

AMENDMENT NO. 83 TO FACILITY OPERATING LICENSE NO. NPF-22

PENNSYLVANIA POWER & LIGHT COMPANY

ALLEGHENY ELECTRIC COOPERATIVE, INC.

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 388

1.0 INTRODUCTION

By letter dated September 4, 1991, the Pennsylvania Power and Light Company and Allegheny Electric Cooperative, Inc. (the licensees) submitted a request for changes to the Susquehanna Steam Electric Station (SSES), Units 1 and 2, Technical Specifications (TS). The requested changes would make changes to the Technical Specification 4.5.1.c.2 such that the High Pressure Coolant Injection (HPCI) system is verified to develop a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when measured at the pump discharge centerline when steam is being supplied to the HPCI turbine at 150 ± 15 psig.

2.0 EVALUATION

Technical Specification Surveillance Requirement 4.5.1.c.2 requires verifying that the HPCI system develops a flow of at least 5000 gpm against a test line pressure of 210 ± 15 psig when steam is being supplied to the HPCI turbine at 150 ± 15 psig. This demonstrates the capability of the HPCI system to inject into the vessel at the lowest system design Reactor Pressure Vessel (RPV) pressure of 150 psig.

The current test line pressure, however, does not meet a newly calculated value, of greater than or equal to 245 psig when measured at the pump discharge centerline, for performance testing at low reactor pressure. This calculation was performed during the licensee's reevaluation of the basis for this test due to the inability to demonstrate the test line pressure requirement during low pressure surveillance testing. (NRC review of this problem is documented in the SSES, Unit 2, Amendment No. 62.)

The license amendments revise Specification 4.5.1.c.2 such that the HPCI system is verified to develop a flow of at least 5000 gpm against a test line pressure of greater than or equal to 245 psig when measured at the discharge centerline when steam is being supplied to the turbine at 150 ± 15 psig.

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Specification 4.5.1.c.2 requires performing a test of the HPCI system at a nominal steam supply pressure of 150 psig. The purpose of the test is to demonstrate that the HPCI system is capable of providing 5000 gpm to the RPV when the RPV is nominally at 150 psig. During startup and power operation an alternate flowpath is used for this test which returns the flow to the Condensate Storage Tank (CST) since actual injection into the RPV is not practical. In order to meet the test's intent of exhibiting HPCI capability to inject, this CST flowpath must impose a back pressure (i.e. test line pressure) on the HPCI pumps which is equivalent to the pressure the pumps would be pumping against when injecting to a nominal 150 psig RPV.

Currently, the test line pressure is required to be 210 ± 15 psig. The licensees' calculation, M-HPC-015, revision 2, determined that this pressure should be greater than or equal to 245 psig when measured at the pump discharge centerline with a steam supply pressure of 165 psig. Implementation of this change will assure this surveillance test meets its intent by exhibiting that HPCI is capable of injecting 5000 gpm to the RPV when steam is nominally supplied to the HPCI turbine at the full range of allowed test pressures, i.e., 135 to 165 psig.

The proposed change corrects a potential error in a Technical Specification requirement that conflicts with a recently performed design calculation. System performance, given the operational conditions of the test, is not in question nor is the safety of the plant. Under the conditions of the test, the required injection flowrate of 5000 gpm can be achieved with the higher test line pressure. In addition to the documented surveillance results which show compliance with current Technical Specification requirements for each unit, testing has been performed on Unit 2 which indicates that the system meets the revised requirements (Unit 1 has been evaluated to also meet these requirements based on similarity with Unit 2 design and performance, and extrapolated test data). The pressure in question is well below the pressure when the low pressure Emergency Core Cooling System (ECCS) systems become available (initiation signal trip setpoint = 436 psig). Meeting the new acceptance criteria for test line pressure continues to prove that the HPCI pumps are capable of achieving rated injection at a nominal steam pressure of 150 psig.

The change addresses a condition where there exists an inadequate basis for a surveillance requirement that is a performance test to demonstrate HPCI operation at the low end of its available operating RPV pressure range. The change does not affect the capability of the HPCI system to perform its intended design function and does not affect the ability of the plant to deal with a high or low pressure Loss of Coolant Accident (LOCA). High pressure operation is demonstrated under a different surveillance requirement which is unaffected by this change. While HPCI operation is assumed in the large break accident analysis for reactor pressures down to 150 psig, its contribution to core reflood rate and thus to peak cladding temperatures is small.

The margin of safety maintained by this Technical Specification is a function of the operation of all ECCS operating in their prescribed modes. Protection against a low pressure LOCA is provided by the low pressure ECCS with only a minor contribution from HPCI under large break LOCA scenarios. The HPCI system is shown to be capable of providing the required flow at higher pressures by design and periodic test. Based on the above, the staff finds the proposed change acceptable.

3.0 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.

4.0 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 surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (56 FR 51927). Accordingly, the amendments meet eligibility criteria for categorical exclusion set forth in 10 FR 51.22(c)(9). Pursuant to 10 FR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 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: James J. Raleigh

Date: December 2, 1991