



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

May 24, 1988

Docket No. 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:

SUBJECT: (TAC NO. 66922) TECHNICAL SPECIFICATION CHANGES SUPPORTING RHR  
WATERHAMMER SUPPRESSION MODIFICATIONS

RE: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

The Commission has issued the enclosed Amendment No. 49 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station (SSES), Unit 2. This amendment is in response to your letter dated December 23, 1987, as revised by your letters dated March 11 and 24, 1988.

This amendment changes the SSES Unit 2 Technical Specifications' Table 3.6.3-1 related to "Primary Containment Isolation Valves." In your letters dated March 11 and 24, 1988 you requested that the Technical Specification changes requested in your December 23, 1987 letter, in support of modification to suppress the potential Residual Heat Removal (RHR) System Waterhammer, are not needed at this time because you have decided to defer the proposed modifications from the current second refueling outage to the third refueling outage. You also indicated that you still intend to delete the automatic closure function of the HV-251F011 A&B valves prior to Unit 2 startup following the second refueling outage, scheduled for May 1988. Accordingly, certain of the approved Technical Specification changes are effective upon startup following the Unit 2 second refueling outage and others will be effective upon startup following the Unit 2 third refueling outage.

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PDR ADDCK 05000388  
P PDR

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be forwarded to the Office of the Federal Register for publication.

Sincerely,

/s/

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 49 to  
License No. NPF-22
2. Safety Evaluation
3. Notice of Issuance

cc w/enclosures:  
See next page

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PDI-2/PA  
MO'Brien  
4/28/88

PDI-2/PM  
MThadani:mr  
4/28/88

PDI-2/D  
WButler  
5/24/88

OGC  
5/10/88

3. This license amendment is effective upon startup following Unit 2 second refueling outage expected in May 1988 except for those changes which have been marked (\*) to indicate that they will be effective upon startup following Unit 2 third refueling outage expected at the end of November 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 24, 1988

PDI-2/LA  
MO'Brien  
4/28/88

MC2  
PDI-2/PM  
MThadani:mr  
4/28/88


OGC APH  
5/16/88

PDI-2/D  
WButler  
5/24/88

WB

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in cursive script, reading "Walter R. Butler".

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 49 to  
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cc w/enclosures:  
See next page

Mr. Harold W. Keiser  
Pennsylvania Power & Light Company

Susquehanna Steam Electric Station  
Units 1 & 2

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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. 49  
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 December 23, 1987 as revised March 11 and 24, 1988 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. 49 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 upon startup following Unit 2 second refueling outage expected in May 1988 except for those changes which have been marked (\*) to indicate that they will be effective upon startup following Unit 2 third refueling outage expected at the end of November 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 24, 1988

PDI-2/LA  
MButler  
4/28/88

*MC2*  
PDI-2/PM  
MThadani:mr  
4/28/88

OGC *AP H*  
5/16/88

PDI-2/D  
WButler  
5/24/88 *WB*

3. This license amendment is effective upon startup following Unit 2 second refueling outage expected in May 1988 except for those changes which have been marked (\*) to indicate that they will be effective upon startup following Unit 2 third refueling outage expected at the end of November 1989.

FOR THE NUCLEAR REGULATORY COMMISSION



Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 24, 1988



ATTACHMENT TO LICENSE AMENDMENT NO. 49

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

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

REMOVE

3/4 6-21

3/4 6-22

3/4 6-23

3/4 6-24

B 3/4 6-3

B 3/4 6-4

INSERT

3/4 6-21

3/4 6-22\*

3/4 6-23\*

3/4 6-24

B 3/4 6-3\*

B 3/4 6-4

TABLE 3.6.3-1 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

<u>VALVE FUNCTION AND NUMBER</u>	<u>MAXIMUM ISOLATION TIME (Seconds)</u>	<u>ISOLATION SIGNAL(S)<sup>(a)</sup></u>
<u>Automatic Isolation Valves (Continued)</u>		
<u>Containment Atmosphere Sample</u>		
SV-25734 A,B	N/A	B,Y
SV-25736 A	N/A	B,Y
SV-25736 B	N/A	B,Y
SV-25740 A,B	N/A	B,Y
SV-25742 A,B	N/A	B,Y
SV-25750 A,B	N/A	B,Y
SV-25752 A,B	N/A	B,Y
SV-25774 A,B	N/A	B,Y
SV-25776 A	N/A	B,Y
SV-25776 B	N/A	B,Y
SV-25780 A,B	N/A	B,Y
SV-25782 A,B	N/A	B,Y
<u>Nitrogen Makeup</u>		
SV-25737	N/A	B,Y,R
SV-25738	N/A	B,Y,R
SV-25767	N/A	B,Y,R
SV-25789	N/A	B,Y,R
<u>Reactor Coolant Sample</u>		
HV-243F019	2	B,C
HV-243F020	2	B,C
<u>Liquid Radwaste</u>		
HV-26108 A1,A2	15	B,Z
HV-26116 A1,A2	15	B,Z
<u>RHR - Suppression Pool</u>		
<u>Cooling/Spray<sup>(c)</sup></u>		
HV-251F028 A,B	90	X,Z
HV-25129 A,B	10	X,Z*
<u>CS Test<sup>(b)(c)</sup></u>		
HV-252F015 A,B	60	X,Z
<u>HPCI Suction<sup>(b)(c)</sup></u>		
HV-255F042	90	L, LB

\* Effective prior to startup following third refueling outage (end of November 1989) |

TABLE 3.6.3-1 (Continued)  
PRIMARY CONTAINMENT ISOLATION VALVES

<u>VALVE FUNCTION AND NUMBER</u>	<u>MAXIMUM ISOLATION TIME (Seconds)</u>	<u>ISOLATION SIGNALS(S) (a)</u>
<u>Automatic Isolation Valves (Continued)</u>		
<u>Suppression Pool Cleanup (b)</u>		
HV-25766	35	A,Z
HV-25768	30	A,Z
<u>HPCI Vacuum Breaker</u>		
HV-255F075	15	LB,Z
HV-255F079	15	LB,Z
<u>RCIC Vacuum Breaker</u>		
HV-249F062	10	KB,Z
HV-249F084	10	KB,Z
<u>TIP Ball Valves (d)</u>		
C51-J004 A,B,C,D,E	5	A,Z
b. <u>Manual Isolation Valves</u>		
<u>MSIV-LCS Bleed Valve</u>		
HV-239F001 B,F,K,P		
<u>Feedwater (e)</u>		
HV-241F032 A,B		
<u>RWCU Return</u>		
HV-24182 A,B		
<u>RCIC Injection</u>		
HV-249F013		
2-49-020		

SUSQUEHANNA - UNIT 2

3/4 6-22

Amendment No. 28

*effective upon startup following  
the unit 2 first refueling outage*

TABLE 3.6.3-1 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

VALVE FUNCTION AND NUMBER

Manual Isolation Valves (Continued)

RCIC Suction<sup>(b)(c)</sup>

HV-249F031

RCIC Turbine Exhaust<sup>(b)</sup>

HV-249F059

RCIC Vacuum Pump Discharge<sup>(b)</sup>

HV-249F060

HPCI Injection

HV-255F006  
2-55-038

RHR - Shutdown Cooling Return/

LPCI Injection

HV-251F015 A,B

RHR - Suppression Pool Suction<sup>(b)(c)</sup>

HV-251F004 A,B,C,D

RHR Heat Exchanger Vent<sup>(c)</sup>

HV-251F103 A,B

CS Injection

HV-252F005 A,B  
HV-252F037 A,B

CS Suction<sup>(b)(c)</sup>

HV-252F001 A,B

Containment Instrument Gas

SV-22654 A,B

TABLE 3.6.3-1 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

VALVE FUNCTION AND NUMBER

Manual Isolation Valves (Continued)

SLCS<sup>(b)</sup>

HV-248F006

Demineralized Water

2-41-017

2-41-018

ILRT

2-57-199

2-57-200

HPCI Turbine Exhaust<sup>(b)</sup>

HV-255F066

RHR-Shutdown Cooling Return/  
LPCI Injection

HV-251F122 A,B

RHR-Suppression Pool  
Cooling/Spray<sup>(c)</sup>

HV-251F011 A,B

c. Other Valves

Feedwater

241F010 A,B

RHR - Shutdown Cooling Suction<sup>(b)</sup>

PSV-251F126

RHR - Shutdown Cooling Return/  
LPCI Injection

HV-251F050 A,B

RHR-Minimum Recirculation Flow<sup>(b)(c)</sup>

HV-251F007 A,B

## CONTAINMENT SYSTEMS

### BASES

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#### 3/4.6.2 DEPRESSURIZATION SYSTEMS

The specifications of this section ensure that the primary containment pressure will not exceed the design pressure of 53 psig during primary system blowdown from full operating pressure.

The suppression chamber water provides the heat sink for the reactor coolant system energy release following a postulated rupture of the system. The suppression chamber water volume must absorb the associated decay and structural sensible heat released during reactor coolant system blowdown from 1055 psig. Since all of the gases in the drywell are purged into the suppression chamber air space during a loss of coolant accident, the pressure of the liquid must not exceed 53 psig, the suppression chamber maximum pressure. The design volume of the suppression chamber, water and air, was obtained by considering that the total volume of reactor coolant and to be considered is discharged to the suppression chamber and that the drywell volume is purged to the suppression chamber.

Using the minimum or maximum water volumes given in this specification, containment pressure during the design basis accident is approximately 45.0 psig which is below the design pressure of 53 psig. Maximum water volume of 133,540 ft<sup>3</sup> results in a downcomer submergence of 12 feet and the minimum volume of 122,410 ft<sup>3</sup> results in a submergence approximately 24 inches less. The majority of the Bodega tests were run with a submerged length of 4 feet and with complete condensation. Thus, with respect to the downcomer submergence, this specification is adequate. The maximum temperature at the end of the blowdown tested during the Humboldt Bay and Bodega Bay tests was 170°F and this is conservatively taken to be the limit for complete condensation of the reactor coolant, although condensation would occur for temperatures above 170°F.

Should it be necessary to make the suppression chamber inoperable, this shall only be done as specified in Specification 3.5.3.

Under full power operating conditions, blowdown from an initial suppression chamber water temperature of 90°F results in a water temperature of approximately 128°F immediately following blowdown which is below the 170°F used for complete condensation via T-quencher devices. At this temperature and atmospheric pressure, the available NPSH exceeds that required by both the RHR and core spray pumps, thus there is no dependency on containment overpressure during the accident injection phase. If both RHR loops are used for containment cooling, there is no dependency on containment overpressure for post-LOCA operations.

Experimental data indicate that excessive steam condensing loads can be avoided if the peak local temperature of the suppression pool is maintained below 200°F during any period of relief valve operation. Specifications have been placed on the envelope of reactor operating conditions so that the reactor can be depressurized in a timely manner to avoid the regime of potentially high suppression chamber loadings.

## CONTAINMENT SYSTEMS

### BASES

#### DEPRESSURIZATION SYSTEMS (Continued)

Because of the large volume and thermal capacity of the suppression pool, the volume and temperature normally changes very slowly and monitoring these parameters daily is sufficient to establish any temperature trends. By requiring the suppression pool temperature to be frequently recorded during periods of significant heat addition, the temperature trends will be closely followed so that appropriate action can be taken. The requirement for an external visual examination following any event where potentially high loadings could occur provides assurance that no significant damage was encountered. Particular attention should be focused on structural discontinuities in the vicinity of the relief valve discharge since these are expected to be the points of highest stress.

In addition to the limits on temperature of the suppression chamber pool water, operating procedures define the action to be taken in the event a safety-relief valve inadvertently opens or sticks open. As a minimum this action shall include: (1) use of all available means to close the valve, (2) initiate suppression pool water cooling, (3) initiate reactor shutdown, and (4) if other safety-relief valves are used to depressurize the reactor, their discharge shall be separated from that of the stuck-open safety relief valve to assure mixing and uniformity of energy insertion to the pool.

Specification 3/4.6.2.3, "Suppression Pool Cooling," is provided to ensure that containment design temperatures and pressures are not exceeded following an accident, and that the suppression pool temperature does not exceed the limits required to provide adequate NPSH for the ECCS pumps. As such, only the valves which support these post accident functions are required to be OPERABLE to achieve the flowpath required by this LCO.

\*

#### 3/4.6.3 PRIMARY CONTAINMENT ISOLATION VALVES

The OPERABILITY of the primary containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through 57 of Appendix A to 10 CFR 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

#### 3/4.6.4 VACUUM RELIEF

Vacuum relief breakers are provided to equalize the pressure between the suppression chamber and drywell. This system will maintain the structural integrity of the primary containment under conditions of large differential pressures.

The vacuum breakers between the suppression chamber and the drywell must not be inoperable in the open position since this would allow bypassing of the suppression pool in case of an accident. There are five pairs of valves to provide redundancy so that operation may continue for up to 72 hours with no more than one pair of vacuum breakers inoperable in the closed position.

\* Effective prior to startup following third refueling outage (end of November 1989) |



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 49 TO FACILITY OPERATING LICENSE NO. NPF-22

PENNSYLVANIA POWER & LIGHT COMPANY

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

1.0 INTRODUCTION

The design basis of the Susquehanna Steam Electric Station (SSES), Unit 2, is based on the assumption that the operation of the Residual Heat Removal (RHR) system in Suppression Pool Cooling (SPC) mode be restricted to 1% of the time on an annual basis. This restriction arises due to the fact that, in the event of an accident requiring switchover of the RHR system from SPC mode to Low Pressure Coolant Injection (LPCI) mode of operation, there is a potential of waterhammer caused by pumping via drained LPCI line. Historically, the SSES Unit 2 has been placed in SPC mode of operation in excess of the 1% (assumed in the design basis) to offset the high suppression pool temperature caused by higher than expected leakage from safety relief valves.

The licensee, by a letter dated December 23, 1987, proposed to modify the RHR system to reduce the potential of waterhammer problem. The proposed modification results in addition of new valves to Table 3.6.3-1 entitled "Primary Containment Isolation Valves," and relocation of an existing valve from the automatic to the manual section of the Table. The licensee indicated that the modifications will be made during second refueling outage and the Technical Specification changes will be needed prior to restart for Cycle 3 operation expected in mid May, 1988. Subsequently, by letters dated March 11 and 24, 1988, the licensee indicated that, due to procurement problems, the licensee is unable to perform the modifications during the second refueling outage, and is postponing the modification to third refueling outage. The licensee requested that the proposed Technical Specification changes associated with the addition of new valves to Table 3.6.3-1 be made effective prior to restart following third refueling outage (currently scheduled in the end of November, 1989). The licensee would still need the approval of relocation of a valve from the automatic to the manual section of the Table to be effective prior to restart from second refueling outage (currently scheduled for May, 1988).



#### 4.0 CONCLUSION

The Commission has issued a Notice of Consideration of Issuance of Amendment to Facility Operating License and Opportunity for Hearing which was published in the Federal Register (53 FR 7995) on March 11, 1989. No petition to intervene or request for hearing has been filed on this action.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributors: Jim Pulsipher and George Thomas

Dated: May 24, 1988

UNITED STATES NUCLEAR REGULATORY COMMISSIONLICENSEEDOCKET NO. 50-388NOTICE OF ISSUANCE OF AMENDMENT TOFACILITY OPERATING LICENSE

The U.S. Nuclear Regulatory Commission (Commission) has issued Amendment No. 49 to Facility Operating License No. NPF-22, issued to Pennsylvania Power and Light Company (the licensee), which revised the Technical Specifications for operation of the Susquehanna Steam Electric Station, Unit 2, located in Luzerne County, Pennsylvania.

The amendment was effective upon startup following Unit 2 second refueling outage expected in May 1988 except for those changes which have been marked (\*) to indicate that they will be effective upon startup following Unit 2 third refueling outage expected at the end of November 1989.

The amendment modified the SSES, Unit 2 Technical Specifications' Table 3.6.3-1 related to "Primary Containment Isolation Valves."

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment.

Notice of Consideration of Issuance of Amendment to Facility Operating License and Opportunity for Hearing in connection with this action was published in the FEDERAL REGISTER on March 11, 1988 (53 FR 7995). No request for a hearing or petition for leave to intervene was filed following this notice.

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The Commission has prepared an Environmental Assessment related to the action and has determined not to prepare an environmental impact statement. Based upon the environmental assessment, the Commission has concluded that the issuance of this amendment will not have a significant effect on the quality of the human environment.

For further details with respect to the action see (1) the application for amendment dated December 23, 1987, and supplemented March 11 and 24, 1988, (2) Amendment No. 49 to License No. NPF-22, and (3) the Commission's related Safety Evaluation and Environmental Assessment. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street NW, and at the Osterhout Free Library, Reference Department, 71 South Franklin Street, Wilkes-Barre, Pennsylvania 18701. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Projects I/II.

Dated at Rockville, Maryland this 24th day of May 1988.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, reading "Walter R. Butler".

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation