

6  
April 1998

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

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1 (TAC NO. M99481)

Dear Mr. Byram:

The Commission has issued the enclosed Amendment No.174 to Facility Operating License No. NPF-14 for the Susquehanna Steam Electric Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 26, 1997, as supplemented by letters dated December 4, 1997, February 2, March 19, and April 2, 1998.

This amendment changes the Susquehanna TSs to support the use of Siemens Power Corporation (SPC) ATRIUM™-10 fuel design in the upcoming Cycle 11 refueling outage.

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/*  
Victor Nerses, Senior Project Manager  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-387

- Enclosures: 1. Amendment No.174 to License No. NPF-14
- 2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION

Docket File	RCapra	GHill(2)	CAnderson, RGN-I
PUBLIC	MO'Brien	THuang	THarris (E-Mail SE)
PDI-2 Reading	VNerses	WBeckner	WGleaves
JZwolinski	OGC	ACRS	LPhillips

\*Previously Concurred

OFFICE	PDI-2/PM	PDI-2/PM	PDI-2/D	SRXB/BC*	OGC*	PDI-2/D
NAME	WGleaves:rb	VNerses	MO'Brien	LPhillips	MYoung	RCapra
DATE	1/98	4/2/98	4/1/98	03/02/98	04/01/98	4/6/98

OFFICIAL RECORD COPY  
DOCUMENT NAME: SU99481.AMD

9804100182 980406  
PDR ADOCK 05000387  
P PDR

**NRC FILE CENTER COPY**



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

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. 174  
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 August 26, 1997, as supplemented by letters dated December 4, 1997, February 2, March 19, and April 2, 1998, 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.

9804100187 980406  
PDR ADDCK 05000387  
P PDR

Mr. Robert G. Byram  
Pennsylvania Power & Light Company

Susquehanna Steam Electric Station,  
Units 1 & 2

cc:

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

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

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

General Manager  
Susquehanna Steam Electric Station  
Pennsylvania Power and Light Company  
Box 467  
Berwick, Pennsylvania 18603

Licensing Group Supervisor  
Pennsylvania Power & Light Company  
2 North Ninth Street  
Allentown, Pennsylvania 18101

Mr. Herbert D. Woodeshick  
Special Office of the President  
Pennsylvania Power and Light Company  
Rural Route 1, Box 1797  
Berwick, Pennsylvania 18603

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

George T. Jones  
Vice President-Nuclear Operations  
Pennsylvania Power and Light Company  
2 North Ninth Street  
Allentown, Pennsylvania 18101

Director-Bureau of Radiation  
Protection  
Pennsylvania Department of  
Environmental Resources  
P. O. Box 8469  
Harrisburg, Pennsylvania 17105-8469

Dr. Judith Johnsrud  
National Energy Committee  
Sierra Club  
433 Orlando Avenue  
State College, PA 16803

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

Chairman  
Board of Supervisors  
738 East Third Street  
Berwick, PA 18603

April 6, 1998

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

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1 (TAC NO. M99481)

Dear Mr. Byram:

The Commission has issued the enclosed Amendment No.174 to Facility Operating License No. NPF-14 for the Susquehanna Steam Electric Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 26, 1997, as supplemented by letters dated December 4, 1997, February 2, March 19, and April 2, 1998.

This amendment changes the Susquehanna TSs to support the use of Siemens Power Corporation (SPC) ATRIUM™-10 fuel design in the upcoming Cycle 11 refueling outage.

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/*  
Victor Nerses, Senior Project Manager  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-387

- Enclosures: 1. Amendment No.174 to License No. NPF-14  
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION

Docket File                      RCapra                      GHill(2)                      CAnderson, RGN-I  
PUBLIC                              MO'Brien                      THuang                      THarris (E-Mail SE)  
PDI-2 Reading                      VNerses                      WBeckner                      WGleaves  
JZwolinski                          OGC                          ACRS                          LPhillips                      \*Previously Concurred

OFFICE	<del>PDI-2/PM</del>	PDI-2/PM	<del>PDI-2/IA</del>	SRXB/BC*	OGC*	PDI-2/D
NAME	<del>WGleaves:rb</del>	VNerses	MO'Brien	LPhillips	MYoung	RCapra <i>RC</i>
DATE	<del>1/198</del>	4/2/98	4/6/98	03/02/98	04/01/98	4/6/98

OFFICIAL RECORD COPY  
DOCUMENT NAME: SU99481.AMD



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

WASHINGTON, D.C. 20555-0001

April 6, 1998

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

**SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1 (TAC NO. M99481)**

Dear Mr. Byram:

The Commission has issued the enclosed Amendment No.174 to Facility Operating License No. NPF-14 for the Susquehanna Steam Electric Station, Unit 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 26, 1997, as supplemented by letters dated December 4, 1997, February 2, March 19, and April 2, 1998.

This amendment changes the Susquehanna TSs to support the use of Siemens Power Corporation (SPC) ATRIUM™-10 fuel design in the upcoming Cycle 11 refueling outage.

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

Sincerely,

A handwritten signature in cursive script that reads "Victor Nerses".

Victor Nerses, Senior Project Manager  
Project Directorate I-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-387

Enclosures: 1. Amendment No.174 to  
License No. NPF-14  
2. Safety Evaluation

cc w/encls: See next page

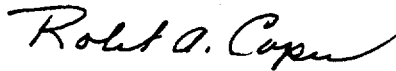
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of the Facility Operating License No. NPF-14 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 174 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 and is to be implemented within 30 days after its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Capra, 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: April 6, 1998

# INDEX

## LIST OF FIGURES

---

FIGURE		PAGE
2.1.2-1	MCPR SAFETY LIMIT .....	2-2a
3.1.5-1	SODIUM PENTABORATE SOLUTION TEMPERATURE/ CONCENTRATION REQUIREMENTS .....	3/4 1-21
3.1.5-2	SODIUM PENTABORATE SOLUTION CONCENTRATION .....	3/4 1-22
3.4.1.1.1-1	THERMAL POWER RESTRICTIONS .....	3/4 4-1b
3.4.1.1.2-1	SINGLE LOOP MCPR SAFETY LIMIT .....	3/4 4-1h
3.4.6.1-1	MINIMUM REACTOR VESSEL METAL TEMPERATURE VS. REACTOR VESSEL PRESSURE .....	3/4 4-18
B 3/4 3-1	REACTOR VESSEL WATER LEVEL .....	B 3/4 3-8
B 3/4.4.6-1	FAST NEUTRON FLUENCE (E>1MeV) AT 1/4 T AS A FUNCTION OF SERVICE LIFE .....	B 3/4 4-7
5.1.1-1	EXCLUSION AREA .....	5-2
5.1.2-1	LOW POPULATION ZONE .....	5-3
5.1.3-1a	MAP DEFINING UNRESTRICTED AREAS FOR RADIOACTIVE GASEOUS AND LIQUID EFFLUENTS .....	5-4
5.1.3-1b	MAP DEFINING UNRESTRICTED AREAS FOR RADIOACTIVE GASEOUS AND LIQUID EFFLUENTS .....	5-5
6.2.1-1	OFFSITE ORGANIZATION .....	6-3
6.2.2-1	UNIT ORGANIZATION .....	6-4

## **1.0 DEFINITIONS**

---

The following terms are defined so that uniform interpretation of these specifications may be achieved. The defined terms appear in capitalized type and shall be applicable throughout these Technical Specifications.

### **ACTION**

- 1.1 ACTION shall be that part of a Specification which prescribes remedial measures required under designated conditions.

### **AVERAGE EXPOSURE**

- 1.2 The AVERAGE BUNDLE EXPOSURE shall be equal to the total energy produced by the bundle divided by the total initial weight of uranium in the fuel bundle.

The AVERAGE PLANAR EXPOSURE at a specified height shall be equal to the total energy produced per unit length at the specified height divided by the total initial weight of uranium per unit length at that height.

### **AVERAGE PLANAR LINEAR HEAT GENERATION RATE**

- 1.3 The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) shall be applicable to a specific planar height and is equal to the sum of the LINEAR HEAT GENERATION RATES for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle at the height.

### **CHANNEL CALIBRATION**

- 1.4 A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel including the sensor and alarm and/or trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an in-place qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

### **CHANNEL CHECK**

- 1.5 A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

### **CHANNEL FUNCTIONAL TEST**

- 1.6 A CHANNEL FUNCTIONAL TEST shall be:
- a. Analog channels - the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions and channel failure trips.
  - b. Bistable channels - the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.

The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is tested.



ATTACHMENT TO LICENSE AMENDMENT NO. 174

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 pages are identified by Amendment number and contain vertical lines indicating the area of change.

REMOVE

xxi  
1-1  
2-1  
-  
B 2-1  
B 2-2  
3/4 4-1c  
-  
5-6  
6-20b  
-  
-

INSERT

xxi  
1-1  
2-1  
2-2a  
B 2-1  
B 2-2  
3/4 4-1c  
3/4 4-1h  
5-6  
6-20b  
6-20c  
6-20d

## **2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS**

### **2.1 SAFETY LIMITS**

#### **THERMAL POWER, Low Pressure or Low Flow**

2.1.1 THERMAL POWER shall not exceed 25% of RATED THERMAL POWER with the reactor vessel steam dome pressure less than 785 psig or core flow less than 10 million lbm/hr.

**APPLICABILITY:** OPERATIONAL CONDITIONS 1 AND 2.

#### **ACTION:**

With THERMAL POWER exceeding 25% of RATED THERMAL POWER and the reactor vessel steam dome pressure less than 785 psig or core flow less than 10 million lbm/hr., be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

#### **THERMAL POWER, High Pressure and High Flow**

2.1.2 The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than the value shown in Figure 2.1.2-1\*\* with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr.

**APPLICABILITY:** OPERATIONAL CONDITIONS 1 AND 2.

#### **ACTION:**

With MCPR less than the value shown in Figure 2.1.2-1\*\* and the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr., be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

#### **REACTOR COOLANT SYSTEM PRESSURE**

2.1.3 The reactor coolant system pressure, as measured in the reactor vessel steam dome, shall not exceed 1325 psig.

**APPLICABILITY:** OPERATIONAL CONDITIONS 1, 2, 3 AND 4.

#### **ACTION:**

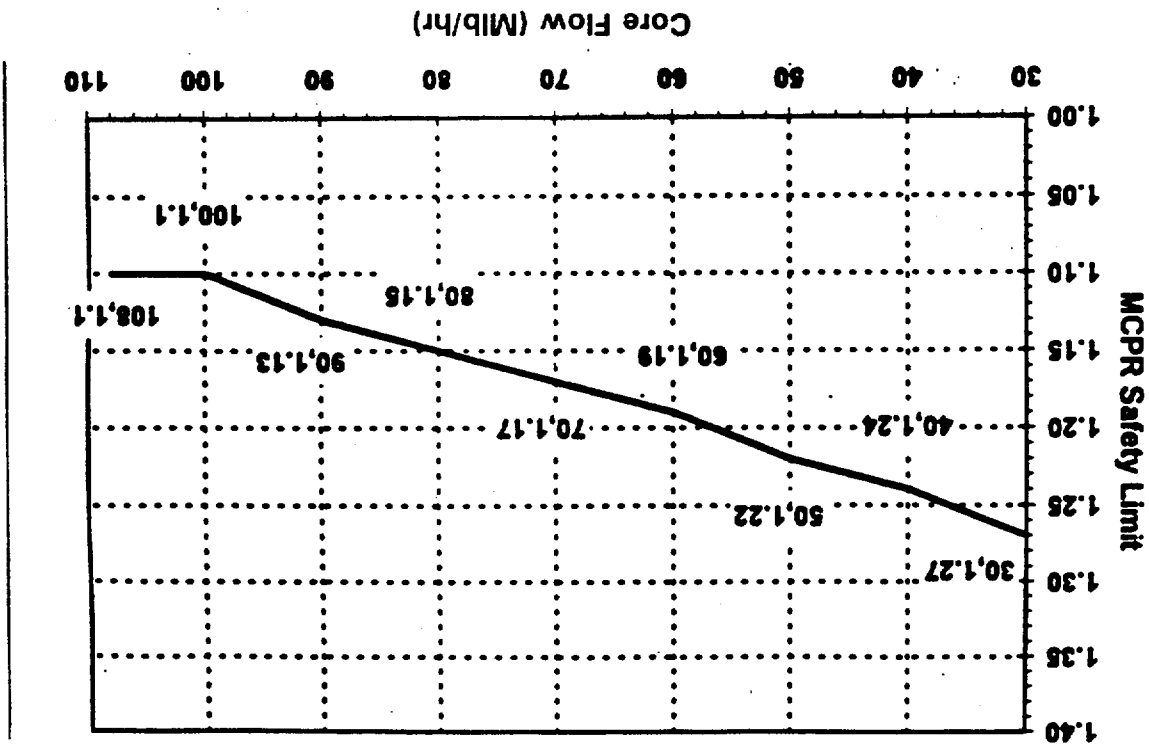
With the reactor coolant system pressure, as measured in the reactor vessel steam dome, above 1325 psig, be in at least HOT SHUTDOWN with reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.1.

---

\* See Specification 3.4.1.1.2.a for single loop operation requirement.

# Only applicable for Unit 1 Cycle 11 operation.

Figure 2.1.2-1  
MCPR Safety Limit vs Core Flow



## **2.1 SAFETY LIMITS**

### **BASES**

---

## **2.0 INTRODUCTION**

The fuel cladding, reactor pressure vessel and primary system piping are the principal barriers to the release of radioactive materials to the environs. Safety Limits are established to protect the integrity of these barriers during normal plant operations and anticipated transients. The fuel cladding integrity Safety Limit is set such that no fuel damage is expected to occur if the limit is not violated. Because fuel damage is not directly observable, a stepback approach is used to establish a Safety Limit such that the MCPR is not less than the limit specified in Specifications 2.1.2 for SPC fuel. MCPR greater than the specified limit represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers which separate the radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses which occur from reactor operation significantly above design conditions and the Limiting Safety System Settings. While fission product migration from cladding perforation is just as measurable as that from use related cracking, the thermally caused cladding perforations signal a threshold beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with a margin to the conditions which would produce onset of transition boiling, MCPR of 1.0. These conditions represent a significant departure from the condition intended by design for planned operation. The MCPR fuel cladding integrity Safety Limit assures that during normal operation and during anticipated operational occurrences, at least 99.9% of the fuel rods in the core do not experience transition boiling (ref. ANF-524(P)(A) Revision 2).

### **2.1.1 THERMAL POWER, Low Pressure or Low Flow**

The use of the ANFB correlation is valid for critical power calculations at pressures greater than 585 psig and bundle mass fluxes greater than  $0.1 \times 10^6$  lbs/hr-ft<sup>2</sup>. For operation at low pressures or low flows, the fuel cladding integrity Safety Limit is established by a limiting condition on core THERMAL POWER with the following basis:

Provided that the water level in the vessel downcomer is maintained above the top of the active fuel, natural circulation is sufficient to assure a minimum bundle flow for all fuel assemblies which have a relatively high power and potentially can approach a critical heat flux condition. For the SPC 9x9-2 fuel design, the minimum bundle flow is greater than 30,000 lbs/hr. For the SPC ATRIUM-10 design, the minimum bundle flow is greater than 28,000 lbs/hr. For both the SPC 9x9-2 and ATRIUM-10 fuel designs, the coolant minimum flow and maximum flow area is such that the mass flux is always greater than  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup>. Full scale critical power test data taken from various SPC and GE fuel designs at pressures from 14.7 psia to 1400 psia indicate that the fuel assembly critical power at  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup> is 3.35 Mwt or greater. At

## **SAFETY LIMITS**

### **BASES**

---

#### **2.1.2 THERMAL POWER, High Pressure and High Flow**

Onset of transition boiling results in a decrease in heat transfer from the clad and, therefore, elevated clad temperature and the possibility of clad failure. However, the existence of critical power, or boiling transition, is not a directly observable parameter in an operating reactor. Therefore, the margin to boiling transition is calculated from plant operating parameters such as core power, core flow, feedwater temperature, and core power distribution. The margin for each fuel assembly is characterized by the critical power ratio (CPR), which is the ratio of the bundle power which would produce onset of transition boiling divided by the actual bundle power. The minimum value of this ratio for any bundle in the core is the minimum critical power ratio (MCPR).

The Safety Limit MCPR assures sufficient conservatism in the operating MCPR limit that in the event of an anticipated operational occurrence from the limiting condition for operation, at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition. The margin between calculated boiling transition (MCPR = 1.00) and the Safety Limit MCPR is based on a detailed statistical procedure which considers the uncertainties in monitoring the core operating state. One specific uncertainty included in the safety limit is the uncertainty inherent in the critical power correlation. Section 6.9.3.2 contains the methodologies used in determining the Safety Limit MCPR.

The ANFB critical power correlation is based on a significant body of practical test data. As long as the core pressure and flow are within the range of validity of the correlation (refer to Section B 2.1.1), the assumed reactor conditions used in defining the safety limit introduce conservatism into the limit because bounding high radial power factors and bounding flat local peaking distributions are used to estimate the number of rods in boiling transition. These conservatisms and the inherent accuracy of the ANFB correlation provide a reasonable degree of assurance that during sustained operation at the Safety Limit MCPR there would be no transition boiling in the core. If boiling transition were to occur, there is reason to believe that the integrity of the fuel would not necessarily be compromised. Significant test data accumulated by the U.S. Nuclear Regulatory Commission and private organizations indicate that the use of a boiling transition limitation to protect against cladding failure is a very conservative approach. Much of the data indicates that LWR fuel can survive for an extended period of time in an environment of boiling transition.

SPC fuel is monitored using the ANFB critical power correlation. The effects of channel bow on MCPR are explicitly included in the calculation of the ANFB MCPR Safety Limit. Explicit treatment of channel bow in the ANFB MCPR Safety Limit addresses the concerns of NRC Bulletin No. 90-02 entitled "Loss of Thermal Margin Caused by Channel Box Bow."

**REACTOR COOLANT SYSTEM**

**RECIRCULATION LOOPS-SINGLE LOOP OPERATION**

**LIMITING CONDITION FOR OPERATION**

3.4.1.1.2 One reactor coolant recirculation loop shall be in operation with the pump speed  $\leq 80\%$  of the rated pump speed and the reactor at a THERMAL POWER/core flow condition outside of Regions I and II of Figure 3.4.1.1.1-1, and

a. the following revised specification limits shall be followed:

1. Specification 2.1.2: the MCPR Safety Limit shall be increased to the value shown in Figure 3.4.1.1.2-1<sup>++</sup>.
2. Table 2.2.1-1: the APRM Flow-Biased Scram Trip Setpoints shall be as follows:

Trip Setpoint	Allowable Value
$\leq 0.58W + 54\%$	$\leq 0.58W + 57\%$

3. Specification 3.2.2: the APRM Setpoints shall be as follows:

Trip Setpoint	Allowable Value
$S \leq (0.58W + 54\%) T$	$S \leq (0.58W + 57\%) T$
$S_{RB} \leq (0.58W + 45\%) T$	$S_{RB} \leq (0.58W + 48\%) T$

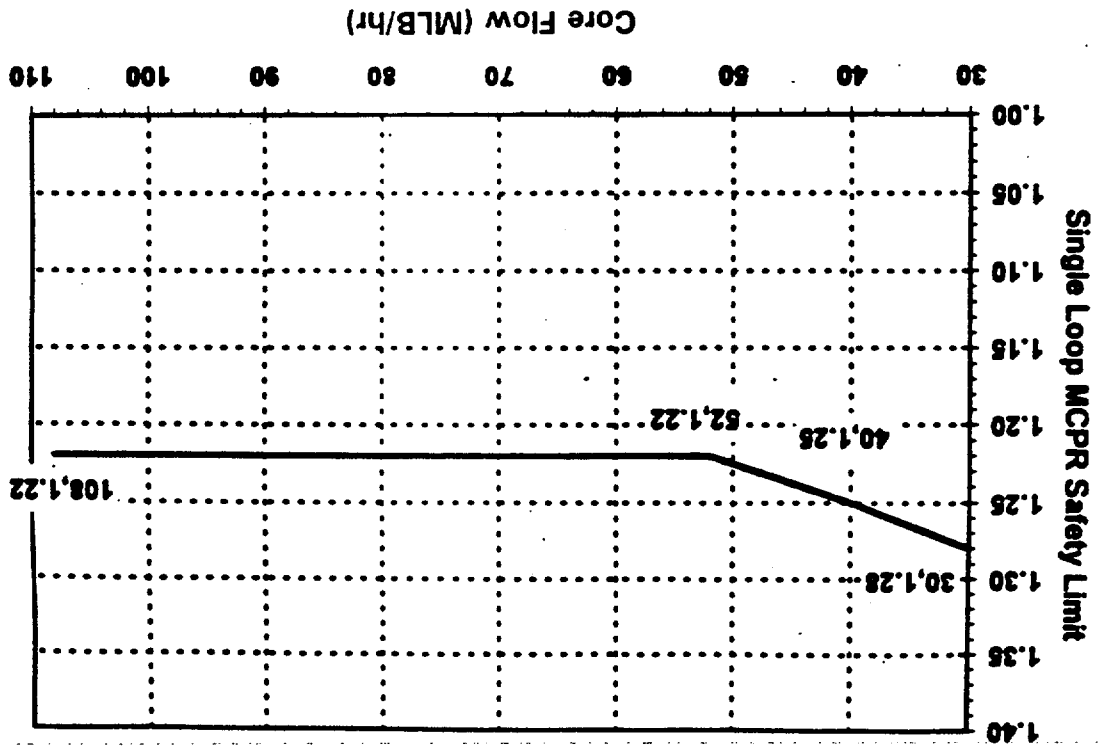
4. Specification 3.2.3: The MINIMUM CRITICAL POWER RATIO (MCPR) shall be greater than or equal to the applicable Single Loop Operation MCPR limit as specified in the CORE OPERATING LIMITS REPORT.
5. Specification 3.2.4: The LINEAR HEAT GENERATION RATE (LHGR) shall be less than or equal to the applicable Single Loop Operation LHGR limit as specified in the CORE OPERATING LIMITS REPORT.
6. Table 3.3.6-2: the RBM/APRM Control Rod Block Setpoints shall be as follows:

	Trip Setpoint	Allowable Value
a. RBM - Upscale	$\leq 0.63W + 35\%$	$\leq 0.63W + 37\%$
	Trip Setpoint	Allowable Value
b. APRM-Flow Biased	$\leq 0.58W + 45\%$	$\leq 0.58W + 48\%$

APPLICABILITY: OPERATIONAL CONDITIONS 1\* and 2<sup>++</sup>, except during two loop operation. #

<sup>++</sup> Only applicable for Unit 1 Cycle 11 operation. Controls to preclude single loop operation shall be maintained as stated in PP&L letter PLA-4872, dated March 19, 1998.

Figure 3.4.1.1.2-1  
MCPR Safety Limit vs Core Flow  
Single Loop Operation



## **DESIGN FEATURES**

---

### **5.3 REACTOR CORE**

#### **FUEL ASSEMBLIES**

5.3.1 The reactor core shall contain 764 fuel assemblies. Each assembly consists of a matrix of Zircaloy clad fuel rods with an initial composition of non-enriched or slightly enriched uranium dioxide as fuel material and water rods or water channels. Limited substitutions of Zirconium alloy filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods, and shown by test or analyses to comply with all fuel safety design bases. A limited number of lead use assemblies that have not completed representative testing may be placed in non-limiting core regions. Reload fuel shall have a maximum lattice average enrichment of 4.5 weight percent U-235.

#### **CONTROL ROD ASSEMBLIES**

5.3.2 The reactor core shall contain 185 cruciform shaped control rod assemblies. The control material shall be boron carbide powder ( $B_4C$ ), and/or Hafnium metal. The control rod shall have a nominal axial absorber length of 143 inches. Control rod assemblies shall be limited to those control rod designs approved by the NRC for use in BWRs.

### **5.4 REACTOR COOLANT SYSTEM**

#### **DESIGN PRESSURE AND TEMPERATURE**

5.4.1 The reactor coolant system is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,
- b. For a pressure of:
  1. 1250 psig on the suction side of the recirculation pumps.
  2. 1500 psig from the recirculation pump discharge to the jet pumps.
- c. For a temperature of 575°F.

#### **VOLUME**

5.4.2 The total water and steam volume of the reactor vessel and recirculation system is approximately 22,400 cubic feet at a nominal  $T_{avg}$  of 532°F.



## **ADMINISTRATIVE CONTROLS**

---

### **CORE OPERATING LIMITS REPORT (Continued)**

9. XN-NF-84-97, Revision 0, "LOCA-Seismic Structural Response of an ENC 9x9 Jet Pump Fuel Assembly," Exxon Nuclear Company, Inc., December 1984.
10. PLA-2728, "Response to NRC Question : Seismic/LOCA Analysis of U2C2 Reload," Letter from H.W. Keiser (PP&L) to E. Adensam (NRC), September 25, 1986.
11. XN-NF-82-06(P)(A), Supplement 1, Revision 2, "Qualification of Exxon Nuclear Fuel for Extended Burnup Supplement 1 Extended Burnup Qualification of ENC 9x9 Fuel," May 1988.
12. XN-NF-80-19(A), Volume 1, and Volume 1 Supplements 1, 2 and 3, "Exxon Nuclear Methodology for Boiling Water Reactors : Neutronic Methods for Design and Analysis," Exxon Nuclear Company, Inc., March 1983.
13. ANF-524(P)(A), Revision 2 and Supplement 1, Revision 2, "Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors", November 1990.
14. ANF-1125(P)(A) and ANF-1125(P)(A), Supplement 1, "ANFB Critical Power Correlation", April 1990.
15. NEDC-32071P, "SAFER/GESTR-LOCA Loss of Coolant Accident Analysis," GE Nuclear Energy, May 1992.
16. NE-092-001A, Revision 1, "Licensing Topical Report for Power Uprate With Increased Core Flow," Pennsylvania Power & Light Company, December 1992.
17. NRC SER on PP&L Power Uprate LTR (November 30, 1993).
18. PL-NF-90-001, Supplement 1-A, "Application of Reactor Analysis Methods for BWR Design and Analysis: Loss of Feedwater Heating Changes and Use of RETRAN MOD 5.1," September 1994.
19. PL-NF-94-005-P-A, "Technical Basis for SPC 9x9-2 Extended Fuel Exposure at Susquehanna SES", January, 1995.
20. CENPD-300-P, "Reference Safety Report for Boiling Water Reactor Reload Fuel", ABB Combustion Engineering Nuclear Operations, November 1994.
21. PL-NF-90-001, Supplement 2-A, "Application of Reactor Analysis Methods for BWR Design and Analysis: CASMO-3G Code and ANFB Critical Power Correlation", July 1996.
22. ANF-89-98(P)(A) Revision 1 and Revision 1 Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," Advanced Nuclear Fuels Corporation, May 1995.
23. XN-NF-81-58(P)(A) Supplements 1 and 2 Revision 2, "RODEX 2 Fuel Rod Thermal-Mechanical Response Evaluation Model," May 1986.
24. XN-NF-85-74(P)(A), "RODEX 2A (BWR) Fuel Rod Thermal-Mechanical Response Evaluation Model," August 1986.

## **ADMINISTRATIVE CONTROLS**

---

### **CORE OPERATING LIMITS REPORT (Continued)**

25. XN-NF-82-06(P)(A) and Supplements 2, 4, and 5 Revision 1, "Qualification of Exxon Nuclear Fuel for Extended Burnup," October 1986.
26. XN-NF-85-92(P)(A), "Exxon Nuclear Dioxide/Gadolinia Irradiation Examination and Thermal Conductivity," November 1986.
27. ANF-90-082(P)(A) Revision 1 and Revision 1 Supplement 1, "Application of ANF Design Methodology for Fuel Assembly Reconstitution," May 1995.
28. ANF-91-048(P)(A), "Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model," January 1993.
29. ANF-CC-33(P)(A) Supplement 2, "HUXY : A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option," January 1991.
30. XN-CC-33(P)(A) Revision 1, "HUXY : A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option Users Manual," November 1975.
31. XN-NF-80-19(P)(A), Volumes 2, 2A, 2B, and 2C "Exxon Nuclear Methodology for Boiling Water Reactors: EXEM BWR ECCS Evaluation Model," September 1982.
32. XN-NF-80-19(P)(A), Volumes 3 Revision 2 "Exxon Nuclear Methodology for Boiling Water Reactors Thermex: Thermal Limits Methodology Summary Description," January 1987.
33. XN-NF-79-71(P)(A) Revision 2, Supplements 1, 2, and 3, "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors," March 1986.
34. ANF-1358(P)(A), Revision 1, "The Loss of Feedwater Heating Transient in Boiling Water Reactors," September 1992.
35. ANF-913(P)(A) Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, "COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses," August 1990.
36. XN-NF-84-105(P)(A), Volume 1 and Volume 1 Supplements 1 and 2, "XCOBRA-T : A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis," February 1987.
37. XN-NF-84-105(P)(A), Volume 1 Supplement 4, "XCOBRA-T " A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis, Void Fraction Model Comparison to Experimental Data," June 1988.

## ADMINISTRATIVE CONTROLS

---

### CORE OPERATING LIMITS REPORT (Continued)

- 38.# EMF-97-010(P), Revision 1, "Application of ANFB to ATRIUM™-10 for Susquehanna Reloads," March 1997.
- 39.# PLA-4595, "Response to NRC Request for Additional Information On Siemens' Report EMF-97-010, Revision 1," March 27, 1997.

6.9.3.3 The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, transient analysis limits and accident analysis limits) of the safety analysis are met.

---

# Only applicable for Unit 1 Cycle 11 operation.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 174 TO FACILITY OPERATING LICENSE NO. NPF-14

PENNSYLVANIA POWER AND LIGHT COMPANY

ALLEGHENY ELECTRIC COOPERATIVE, INC.

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1

DOCKET NO. 50-387

## 1.0 INTRODUCTION

By letter dated August 26, 1997, and supplemented letters dated December 4, 1997, February 2, March 19, and April 2, 1998, the Pennsylvania Power and Light Company (PP&L, the licensee) submitted a request for changes to the Susquehanna Steam Electric Station (SSES), Unit 1, Technical Specifications (TSs). The requested changes would modify the Susquehanna Unit 1 TSs to support the use of Siemens Power Corporation (SPC) ATRIUM™-10 fuel in the upcoming Cycle 11 core reload, which is its first 24-month operating cycle. The proposed changes include the Safety Limit Minimum Critical Power Ratio (SLMCPR) based on the cycle-specific analysis of the mixed core of SPC ATRIUM™-10 and SPC 9x9-2 fuel parameters, and other sections of the TSs relating to the use of ATRIUM™-10 fuel. The December 4, 1997, February 2, March 19, and April 2, 1998, submittals provided clarifying information that did not change the initial no significant hazards consideration determination.

## 2.0 EVALUATION

The licensee revised TS page xxi, LIST OF FIGURES, to reflect the addition of two new figures titled MCPR SAFETY LIMIT and SINGLE LOOP MCPR SAFETY LIMIT. In the revised submittal, dated February 2, 1998, on page xxi, the Single Loop MCPR Safety Limit page number was changed from 3/4 4-1g to 3/4 4-1h to correctly reflect the new Figure 3.4.1.1.2-1.

### 2.1 Mechanical Design

The ATRIUM™-10 fuel design is a 10x10 lattice design which contains 83 full length fuel rods, 8 part length fuel rods, and a central water channel to enhance neutron moderation. The ATRIUM™-10 fuel design was analyzed and assessed by Siemens according to the NRC-approved methodology, entitled, "Generic Mechanical Design Criteria for BWR Fuel Designs," ANF-89-98(P)(A) Revision 1 and Revision 1 Supplement 1. The staff has performed an on-site inspection of ATRIUM™-10 fuel at Siemens. Although the staff discovered a procedural deficiency, we conclude that, with the correction of the deficiency as documented in Inspection Report 99900081/97-01, dated October 27, 1997, pages 55 and 56 (Reference 8), the ATRIUM™-10 fuel mechanical design followed the approved methodology, and therefore, is acceptable for Susquehanna 1 Cycle 11 (S1C11).

### 2.2 Application of the ANFB Critical Power Correlation to ATRIUM™-10 Fuel

In response to findings resulting from a Nuclear Regulatory Commission (NRC) vendor inspection at the SPC during the week of February 9-14, 1997, PP&L has submitted a revised ANFB methodology with core flow dependent MCPR safety limits and a supporting topical report,

EMF- 97-010(P), Revision 1, "Application of ANFB to ATRIUM™-10 for Susquehanna Reloads," March 1997, and PLA-4595 FILE R41-2, Susquehanna Steam Electric Station, "Response to NRC Request for Additional Information on Siemens' Report EMF-97-010, Revision 1, March 27, 1997 (References 4 and 5). The detailed review was given in a letter from Chester Poslusny, NRC, to Robert G. Byram, PP&L, Susquehanna Steam Electric Station, Unit 2 (TAC No. M97499), dated May 7, 1997 (Reference 6). This review and approval is also applicable to Unit 1 because the fuel is the same design as was used in Unit 2.

### 2.3 Technical Specification Changes

The licensee requested a change to the S1C11 TSs in accordance with 10 CFR 50.90. The proposed revisions of the TSs and the associated Bases are described below.

#### (1) TS 1.2 Average Exposure and 1.3 Average Planar Linear Heat Generation Rate

On page 1-1 of the TSs, Section 1.0 DEFINITIONS, the definition of AVERAGE EXPOSURE currently reads as follows:

- 1.2 The AVERAGE BUNDLE EXPOSURE shall be equal to the sum of the axially averaged exposure of all the fuel rods in the specified bundle divided by the number of fuel rods in the fuel bundle.

The AVERAGE PLANAR EXPOSURE shall be applicable to a specific planar height and is equal to the sum of the exposure of all fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.

This definition is proposed to be entirely replaced by the following definition:

- 1.2 The AVERAGE BUNDLE EXPOSURE shall be equal to the total energy produced by the bundle divided by the total initial weight of uranium in the fuel bundle.

The AVERAGE PLANAR EXPOSURE at a specified height shall be equal to the total energy produced per unit length at the specified height divided by the total initial weight of uranium per unit length at that height.

The proposed changes of definitions for TS 1.2 average bundle exposure and average planar exposure and for TS 1.3 average planar linear heat generation rate to reflect the use of part length rods in the ATRIUM™-10 fuel assemblies as well as full length rods in SPC 9x9-2 fuel assemblies are acceptable since the new wordings accurately reflect the calculation of average planar exposure for fuel containing part length fuel rods.

#### (2) TS 2.1.2 and 3.4.1.1.2

The licensee proposed two changes on Page 2-1 of the TSs. Section 2.1, SAFETY LIMITS, describes, in part, limits for thermal power under high pressure and high flow in paragraph 2.1.2. Paragraph 2.1.2 currently reads as follows:

The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.00\* with the reactor vessel steam dome pressure greater than 785 psig and core flow

The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.00\* with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr.

The licensee proposed to change that paragraph to read:

The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than the value shown in Figure 2.1.2-1\*\* with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr.

Also the licensee proposed to change the action statement under paragraph 2.1.2. That statement currently states:

With MCPR less than 1.09\* and the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr., be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

The proposed change reads as follows:

With MCPR less than the value shown in Figure 2.1.2-1\*\* and the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr., be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

A footnote on page 2-1 is added:

# Only applicable for Unit 1 Cycle 11 operation.

The original footnote, marked with the asterisk, is unchanged.

Susquehanna TSs page 3/4 4-1c, LIMITING CONDITION FOR OPERATION, for RECIRCULATION LOOPS-SINGLE OPERATION, in Section 3.4.1.1.2.a.1, currently states:

1. Specification 2.1.2: the MCPR Safety Limit shall be increased to 1.10.

This specification is proposed to be changed to read:

1. Specification 2.1.2: the MCPR Safety Limit shall be increased to the value shown in Figure 3.4.1.1.2-1\*\*.

A footnote, denoted by the symbol \*\*, is proposed for the bottom of the page to explain that this condition is only applicable for Unit 1 Cycle 11 operation.

The safety limit MCPR in TS 2.1 is proposed to change from 1.08 to the value shown in Figure 2.1.2-1 ( $\geq 1.11$  depending on the core flow) for operation with two recirculation loops with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 million lbm/hr., and from 1.09 to the value shown in Figure 3.4.1.1.2-1 ( $\geq 1.22$ ) for single loop operation

(SLO) based on the cycle-specific analysis of a modified ANFB core performed by SPC for S1C11 mixed core of ATRIUM™-10/SPC 9x9-2 fuel. However, PP&L noted that the SPC methodology did not examine the bottom 3 feet of the fuel bundle in determining the ANFB predicted critical power. PP&L, in dealing with this issue, took conservative action and imposed administrative controls by changing the applicable General Operating procedure, the Off-Normal Operating procedure and the system-specific Operating Procedure to preclude single-loop operation or to impose conditions limiting the time in single loop operation until resolution of this issue (References 3, 7 and 9).

The staff has reviewed the proposed changes to TS Sections 2.1.2 and 3.4.1.1.2 and has found them acceptable since they are based on the analyses performed using S1C11 cycle-specific inputs and approved methodologies in References 4 and 5 and PP&L's conservative actions to restrict single-loop operation.

(3) TS Bases 2.1.1 and 2.1.2

The revision to the bases of the TSs on page B 2-1 discusses in Section 2.1.1, THERMAL POWER, Low Pressure or Low Flow, was proposed to include the minimum bundle mass flow for the ATRIUM™-10 fuel design and the results of full scale critical power testing of various General Electric and SPC fuel designs. These proposed changes reflect that it is applicable for both 9x9-2 and ATRIUM™-10 fuel.

The third and fourth sentences of the second paragraph of Section 2.1.1 currently reads:

For the SPC 9x9-2 design, the coolant minimum flow and maximum flow area is such that the mass flux is always greater than  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup>. Full scale critical power tests taken at pressures down to 14.7 psia indicate that the fuel assembly critical power at  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup> is 3.35 Mwt or greater.

SSES proposed to replace the current sentences in Section 2.11 with the following:

For the SPC ATRIUM-10 design, the minimum bundle flow is greater than 28,000 lbs/hr. For both the SPC 9x9-2 and ATRIUM-10 fuel designs, the coolant minimum flow and maximum flow area is such that the mass flux is always greater than  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup>. Full scale critical power test data taken from various SPC and GE fuel designs at pressures from 14.7 psia to 1400 psia indicate that the fuel assembly critical power at  $0.25 \times 10^6$  lbs/hr-ft<sup>2</sup> is 3.35 Mwt or greater.

The revision to the bases of the TSs on page B 2-2 that discusses in the second paragraph of Section 2.1.2, THERMAL POWER High Pressure and High Flow, proposed to eliminate the direct references to the methodologies used to determine the Safety Limit MCPR and refer to Section 6.9.3.2 of the TSs. An additional proposed revision is to change a sentence in the third paragraph of Section 2.1.2 which currently reads:

The ANFB critical power correlation is based on a significant body of practical test data, providing a high degree of assurance that the critical power as evaluated by the correlation is within a small percentage of the actual critical power being estimated.

The proposed change deletes part of this sentence so that it reads:

The ANFB critical power correlation is based on a significant body of practical test data.

The staff has reviewed the proposed changes and found them acceptable since they are administrative in nature to reflect the use of the part length rods in the ATRIUM™-10 fuel assemblies as well as full length rods in SPC 9x9-2 fuel assemblies.

**(4) TS 5.3.1 - Fuel Assemblies**

Page 5-6 of the SSES Unit 1 TSs, Section 5.3.1, FUEL ASSEMBLIES, was revised to reflect the use of ATRIUM™-10 fuel with a central water channel, part length fuel rods and different active fuel length from that of SPC 9x9-2 and to increase the maximum allowed enrichment from 4.0 to 4.5 weight percent U-235 which is consistent with 10 CFR 51.52.

The proposed revision to Section 5.3.1 follows:

The second sentence in Section 5.3.1 currently reads:

Each assembly consists of a matrix of Zircaloy clad fuel rods with an initial composition of non-enriched or slightly enriched uranium dioxide as fuel material and water rods.

The second sentence in Section 5.3.1 is proposed to read as follows:

Each assembly consists of a matrix of Zircaloy clad fuel rods with an initial composition of non-enriched or slightly enriched uranium dioxide as fuel material and water rods or water channels.

The sixth sentence of Section 5.3.1, which currently reads,

Each fuel rod shall have a nominal active fuel length of 150 inches.

is proposed to be deleted.

The sixth and seventh sentences of Section 5.3.1 currently read:

Each fuel rod shall have a nominal active fuel length of 150 inches. Reload fuel shall have a maximum average enrichment of 4.0 weight percent U-235.

The sixth and seventh sentences in Section 5.6.1 will be replaced by the following proposed sentence:

Reload fuel shall have a maximum lattice average enrichment of 4.5 weight percent U-235.

Based on the staff evaluation, we conclude that this revision is consistent with the proposed use of ATRIUM™-10 fuel and will reflect the composition of the SSES reactor core. Therefore, the



proposed changes are acceptable for SSES Unit 1.

(5) TS 6.9.3.2 - Core Operating Limits Report

On Page 6-20b, which contains the references of the Core Operating Limits Report, PP&L proposed to reference, the following additional approved methodologies relating to the use of SPC ATRIUM™-10 fuel assemblies.

- (22) ANF-89-98(P)(A) Revision 1 and Revision 1 Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Design," Advanced Nuclear Fuel Corporation, May 1995.
- (23) XN-NF-81-58(P)(A) Supplements 1 and 2, Revision 2, "RODEX 2 Fuel Rod Thermal-Mechanical Response Evaluation Model," May 1986.
- (24) XN-NF-85-74(P)(A), "RODEX 2A (BWR) Fuel Rod Thermal-Mechanical Response Evaluation Model," August 1986.
- (25) XN-NF-82-06(P)(A) and Supplements 2, 4, and 5 Revision 1, "Qualification of Exxon Nuclear Fuel for Extended Burnup," October 1986.
- (26) XN-NF-85-92(P)(A), "EXXON Nuclear Uranium Dioxide/Gadolinia Irradiation Examination and Thermal Conductivity," November 1986.
- (27) ANF-90-082(P)(A) Revision 1 and Revision 1 Supplement 1, "Application of ANF Design Methodology for Fuel Assembly Reconstitution," May 1995.
- (28) ANF-91-048(P)(A), "Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model," January 1993.
- (29) ANF-CC-33(P)(A) Supplement 2, "HUXY: A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option," January 1991.
- (30) XN-CC-33(P)(A) Revision 1, "HUXY: A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option Users Manual," November 1975.
- (31) XN-NF-80-19(P)(A) Volumes 2, 2A, 2B, and 2C "Exxon Nuclear Methodology for Boiling Water Reactors: EXEM BWR ECCS Evaluation Model," September 1982.
- (32) XN-NF-80-19(P)(A), Volume 3 Revision 2 "Exxon Nuclear Methodology for Boiling Water Reactors Thermex: Thermal Limits Methodology Summary Description," January 1987.
- (33) XN-NF-79-71(P)(A), Revision 2, Supplements 1, 2, and 3, "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors," March 1986.
- (34) ANF-1358(P)(A) Revision 1, "The Loss of Feedwater Heating Transient in Boiling Water Reactors," September 1992.
- (35) ANF-913(P)(A) Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, "COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses," August 1990.

(39) PLA-4595, "Response to NRC Request for Additional Information on Siemens' Report EMF-97-010, Revision 1, March 27, 1997.

#Only Applicable for S1C11 Operation.

The staff has concluded that the generic methodologies (22) - (37) are applicable to this plant-specific ATRIUM-10 fuel design. Based on our review, we also conclude that methodologies (38) and (39) are acceptable for only the S1C11 application since the proposed fuel design has been analyzed on a plant- and cycle-specific basis using the NRC-approved methodologies. Finally, we conclude that the changes to the TSs and the associated Bases are acceptable for S1C11 refuel application. Use of NRC-approved methodology will ensure that values for cycle-specific parameters will be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, emergency core cooling system limits, nuclear limits, transient analysis limits, and accident analysis limits) of the safety analysis are met.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact have been prepared and published in the Federal Register on April 1, 1998 (63 FR 15900). Accordingly, based upon the environmental assessment, the staff has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

### 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. Huang

Date: April 6, 1998

## 6.0 REFERENCES

1. PLA-4664 FILES R41-1/A17-2, "Susquehanna Steam Electric Station Proposed Amendment No. 209 to License NPF-14: Unit 1 Technical Specification Changes for ATRIUM™-10," August 26, 1997.
2. PLA-4802 FILES A17-2/R41-2, "Susquehanna Steam Electric Station Unit 1 Cycle 11 Information," December 4, 1997.
3. PLA-4841 FILE R41-2, "Susquehanna Steam Electric Station Revision to Bases for Proposed Amendment No. 209 to License NPF-14 and Response to NRC Request for Additional Information," February 2, 1998.
4. EMF-97-010(P), Revision 1, "Application of ANFB to ATRIUM™-10 for Susquehanna Reloads," March 1997.
5. PLA-4595 FILE R41-2, "Susquehanna Steam Electric Station, Response to NRC Request for Additional Information on Siemens' Report EMF-97-010, Revision 1," March 27, 1997.
6. Letter from Chester Poslusny, NRC, to Robert G. Byram, PP&L, "Susquehanna Steam Electric Station, Unit 2 (TAC No. M97499)," May 7, 1997.
7. PLA-4872, "Susquehanna Steam Electric Station Clarification of information for Proposed Amendment No. 209 to License NPF-14," March 19, 1998.
8. EA97-495, "Demand for Information and Notice of Non-Conformance (Inspection Report 9990008/97-01)," October 27, 1997.
9. PLA-4879, "Susquehanna Steam Electric Station Revision to Proposed Amendment No. 209 to License NPF-14," April 2, 1998.