

CATEGORY 1

REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9704280004 DOC.DATE: 97/04/18 NOTARIZED: YES DOCKET #
 FACIL:50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv 05000388
 AUTH.NAME AUTHOR AFFILIATION
 JONES,G.T. Pennsylvania Power & Light Co.
 RECIPI.NAME RECIPIENT AFFILIATION
 Document Control Branch (Document Control Desk)

SUBJECT: Forwards application for amend to license NPF-22, revising
 core flow dependent MCPR safety limits in Sections 2.1.2 &
 3.4.1.1.2.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 9+6
 TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT		COPIES		RECIPIENT		COPIES	
	ID	CODE/NAME	LTR	ENCL	ID	CODE/NAME	LTR	ENCL
	PD1-2	LA	1	1	PD1-2	PD	1	1
	POS	LUSNY,C	1	1				
INTERNAL:	ACRS		1	1	<u>FILE CENTER</u>	01	1	1
	NRR/DE/ECGB/A		1	1	NRR/DE/EMCB		1	1
	NRR/DRCH/HICB		1	1	NRR/DSSA/SPLB		1	1
	NRR/DSSA/SRXB		1	1	NUDOCS-ABSTRACT		1	1
	OGC/HDS2		1	0				
EXTERNAL:	NOAC		1	1	NRC PDR		1	1

NOTE TO ALL "RIDS" RECIPIENTS:
 PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS
 OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL
 DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTR 14 ENCL 13

C
A
T
E
G
O
R
Y
1
D
O
C
U
M
E
N
T



Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101-1179 • 610/774-5151

George T. Jones
Vice President - Nuclear Operations
610/774-7602
Fax: 610/774-7797

APR 18 1997

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
ADDENDUM #3 TO PROPOSED AMENDMENT NO. 166
TO LICENSE NPF-22: REVISED CORE FLOW DEPENDENT
MCPR SAFETY LIMITS
PLA-4613**

FILES R41-1/A17-2

Docket No. 50-388

- References:*
1. PLA-4527, "Proposed Amendment No. 166 to License NPF-22: Unit 2 Technical Specification Changes for ATRIUM™-10 Fuel," December 18, 1996.
 2. PLA-4582, "Addendum to Proposed Amendment No. 166 to License NPF-22: Revised ANFB Methodology and Core Flow Dependent MCPR Safety Limits," March 12, 1997.
 3. EMF-97-010, Rev. 1, "Application of ANFB to ATRIUM™-10 for Susquehanna Reloads," March 1997.
 4. PLA-4599, "Addendum #2 to Proposed Amendment No. 166 to License NPF-22: Addition of Limiting Footnotes and a Reference Reflecting PP&L's RAI Response," April 3, 1997.

The purpose of this letter is to propose changes to the Susquehanna Steam Electric Station Unit 2 Technical Specifications. References 1, 2, and 4 describe proposed changes to the Unit 2 Technical Specifications related to the scheduled use of Siemens Power Corporation (SPC) ATRIUM™-10 fuel. Reference 3 contains methodology currently under NRC review which is used to support use of ATRIUM™-10 fuel for Unit 2 Cycle 9.

The ANFB correlation uncertainty is expressed in terms of an uncertainty on the correlation additive constants. Reference 2 provided proposed core flow dependent MCPR Safety Limits which implemented an increased additive constant uncertainty for ATRIUM™-10 fuel assuming linear interpolation at bundle flows below 0.05 Mlb/hr. Recent NRC interactions during the review of Reference 3 have indicated a desire to further increase the assumed ANFB additive constant uncertainty for ATRIUM™-10 fuel at low bundle flows -- specifically, use of a step change in additive constant uncertainty from 0.017 to 0.031 for bundle flows below 0.05 Mlb/hr. This proposed change entails revised core flow dependent MCPR Safety Limits in Sections 2.1.2 and 3.4.1.1.2 (generated using the increased uncertainty for bundle flows less than 0.05 Mlb/hr).

250078



A001/1

9704280004 970418
PDR ADDCK 05000388
P PDR

Enclosure A to this letter is the "Safety Assessment" supporting this change. Enclosure B is the "No Significant Hazards Considerations" evaluation performed in accordance with the criteria of 10 CFR 50.92. Enclosure C to this letter contains the applicable pages of the Susquehanna SES Unit 2 Technical Specifications marked to show the proposed changes. The proposed changes have been approved by the Susquehanna SES Plant Operations Review Committee and reviewed by the Susquehanna Review Committee.

PP&L plans to implement the proposed changes in April 1997 to support Cycle 9 operation. Therefore, we request NRC complete its review of this change request by April 25, 1997 to support our scheduled implementation dates.

Any questions regarding this request should be directed to Mr. A. K. Maron at (610) 774-7727.

Very truly yours,



G. T. Jones

Attachments

copy: NRC Region I
Mr. C. Poslusny, Jr., NRC Sr. Project Manager - OWFN
Mr. K. M. Jenison, NRC Sr. Resident Inspector - SSES
Mr. W. P. Dornsife, Pa. DEP

SAFETY ASSESSMENT

REVISED CORE FLOW DEPENDENT MCPR SAFETY LIMITS

BACKGROUND

Susquehanna Steam Electric Station Unit 2, Cycle 9 will utilize SPC ATRIUM™-10 fuel. 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.

During an NRC inspection of Siemens Power Corporation, the NRC raised a number of issues regarding the application of ANFB to ATRIUM™-10. To address these issues, SPC developed a more conservative MCPR methodology to support the use of ANFB for the U2C9 reload of ATRIUM™-10 at Susquehanna Steam Electric Station. Approval of the Reference 3 methodology is required to support Unit 2 Cycle 9 Operation.

The ANFB correlation uncertainty is expressed in terms of an uncertainty on the correlation additive constants. Reference 2 provided proposed core flow dependent MCPR Safety Limits which implemented an increased additive constant uncertainty for ATRIUM™-10 fuel assuming linear interpolation at bundle flows below 0.05 Mlb/hr. Recent NRC interactions during the review of Reference 3 have indicated a desire to further increase the assumed ANFB additive constant uncertainty for ATRIUM™-10 fuel at low bundle flows -- specifically, use of a step change in additive constant uncertainty from 0.017 to 0.031 for bundle flows below 0.05 Mlb/hr. This proposed change entails revised core flow dependent MCPR Safety Limits in Sections 2.1.2 and 3.4.1.1.2 (generated using the increased uncertainty for bundle flows less than 0.05 Mlb/hr).

Description of the Proposed Change

The proposed Unit 2 Technical Specification change consists of the inclusion of revised core flow dependent MCPR Safety Limits to Sections 2.1.2 and 3.4.1.1.2.

SAFETY ANALYSIS

This section discusses the safety implications of the proposed action.

Excessive overheating of the fuel rod cladding can result in cladding damage and the release of fission products. In order to protect the cladding against overheating due to boiling transition, the THERMAL POWER, High Pressure and High Flow SAFETY LIMITs (Sections 2.1.2 and 3.4.1.1.2 of the Susquehanna SES Unit 2 Technical Specifications) were established.

NUREG-0800, Standard Review Plan Section 4.4, specifies an acceptable, conservative approach to define this SAFETY LIMIT. Specifically, a Minimum Critical Power Ratio (MCPR) value is specified such that at least 99.9% of the fuel rods are expected to avoid boiling transition during normal operation or anticipated operational occurrences. Boiling transition is predicted using a correlation based on test data (i.e., a Critical Power Correlation). The SAFETY LIMIT MCPR calculation accounts for various uncertainties such as feedwater flow, feedwater temperature, pressure, power distribution uncertainties, and uncertainty in the Critical Power Correlation. Currently, the ANFB Critical Power Correlation is used to predict boiling transition for SPC fuel at Susquehanna.

The proposed cycle specific SAFETY LIMIT MCPR values (two-loop and single-loop) were calculated using SPC's NRC approved licensing methods as modified by Reference 3. The Reference 3 methodology addresses an observed flow dependence in the accuracy of ANFB's critical power predictions for ATRIUM™-10 fuel as well as an increased correlation uncertainty for high local peaking factor rods. The relation of predicted critical power to bundle flow, the flow dependent correlation uncertainties, and the increased uncertainty for high local peaking factor rods are derived directly from ATRIUM™-10 critical heat flux test data and are used as input to the Safety Limit analyses. To address the flow dependence, safety limit calculations (using SPC's NRC approved methodology) are performed at various core flows to generate a core flow dependent MCPR Safety Limit. The SAFETY LIMIT MCPRs (two-loop and single-loop) are defined as functions of core flow according to the Reference 3 methodology and assure that at least 99.9% of the fuel rods are expected to avoid boiling transition during normal operation or anticipated operational occurrences.

CONCLUSIONS

The proposed changes to the Susquehanna SES Unit 2 Technical Specifications support the use of ATRIUM-10 fuel. Reference 3 presents a Susquehanna specific conservative methodology for applying the ANFB critical power correlation to ATRIUM™-10 fuel. The Reference 3 methodology and the increased ATRIUM™-10 additive constant uncertainty for low bundle flows produce more conservative MCPR Safety Limits and Operating Limits for Unit 2 Cycle 9.

NRC approval of the proposed Technical Specification changes (References 1, 2, 4, and this letter) will ensure that the methodologies contained in Technical Specification Section 6.9.3.2 can be used in support of ATRIUM™-10 fuel at Susquehanna Unit 2.

REFERENCES

1. PLA-4527, "Proposed Amendment No. 166 to License NPF-22: Unit 2 Technical Specification Changes for ATRIUM-10 Fuel", December 18, 1996.
2. PLA-4582, "Addendum to Proposed Amendment No. 166 to license NPF-22: Revised ANFB Methodology and Core Flow Dependent MCPR Safety Limits", March 12, 1997.
3. EMF-97-010, Rev. 1, "Application of ANFB to ATRIUM-10 for Susquehanna Reloads", March 1997.
4. PLA-4599, "Addendum #2 to Proposed Amendment No. 166 to License NPF-22: Addition of Limiting Footnotes and a Reference Reflecting PP&L's RAI Response," April 3, 1997.

**NO SIGNIFICANT HAZARDS CONSIDERATIONS AND ENVIRONMENTAL
ANALYSIS**

**REVISED CORE FLOW DEPENDENT
MCPR SAFETY LIMITS**

NO SIGNIFICANT HAZARDS CONSIDERATIONS

Pennsylvania Power & Light Company has evaluated the proposed Technical Specification change in accordance with the criteria specified by 10 CFR 50.92 and has determined that the proposed change does not involve a significant hazards consideration. The criteria and conclusions of our evaluation are presented below.

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The applicable sections of the FSAR are Chapter 15. Chapter 15 describes the transient and accident analyses. A discussion of the impact of the proposed Technical Specification change is provided below.

The proposed change in MCPR methodology does not physically affect the plant or its systems. Thus, it does not increase the probability of an accident previously evaluated.

A cycle specific MCPR Safety Limit analysis was performed for PP&L by SPC. This analysis used NRC approved methods described in Technical Specification Reference 13 (ANF-524(P)(A), Revision 2 and Supplement 1 Revision 2), as modified by EMF-97-010(P), Rev. 1. The SAFETY LIMIT MCPR calculation statistically combines uncertainties on feedwater flow, feedwater temperature, core flow, core pressure, core power distribution, and the uncertainty in the Critical Power Correlation. The SPC analysis used cycle specific power distributions and calculated MCPR values such that at least 99.9% of the fuel rods are expected to avoid boiling transition during normal operation or anticipated operational occurrences. The SAFETY LIMIT MCPRs are specified as a function of core flow. The resulting two-loop and single-loop values (Technical Specification Sections 2.1.2 and 3.4.1.1.2) are included in the proposed change. Thus, the cladding integrity and its ability to contain fission products are not adversely affected.

The methodology described in EMF-97-010(P), Rev. 1, and an increased ATRIUM™-10 additive constant uncertainty for low bundle flows are used to determine the MCPR Safety Limits for Unit 2 Cycle 9. The result of using this methodology are core flow dependent MCPR Safety Limits plus conservative MCPR Operating Limits for Unit 2 Cycle 9. The resulting MCPR Safety Limits and Operating Limits will continue to assure that at least 99.9% of the fuel rods are expected to avoid boiling transition during normal operation or anticipated operational occurrences. Thus, the cladding integrity and its ability to contain fission products are not adversely affected.

The consequences of transients and accidents will remain within the criteria approved by the NRC. Thus, analysis results using the new, more conservative methodology will continue to provide assurance that the reactor will perform its design safety function during normal operation and design basis events. Therefore, the proposed action does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The proposed changes to the Unit 2 Technical Specifications do not require any physical plant modifications, physically affect any plant components, or entail significant changes in plant operation. Thus, the proposed change does not create the possibility of a previously unevaluated operator error or a new single failure. The consequences of transients and accidents will remain within the criteria approved by the NRC. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **The proposed change does not involve a significant reduction in a margin of safety.**

The applicable Technical Specification Sections include 2.0, 3/4.2, and 3/4.4.

The changes to the Unit 2 Technical Specifications discussed in Item 1 above do not require any physical plant modifications, physically affect any plant components, or entail significant changes in plant operation. Therefore, the proposed change will not jeopardize or degrade the function or operation of any plant system or component governed by Technical Specifications. The consequences of transients and accidents will remain within the criteria approved by the NRC. The proposed MCPR Safety Limits maintain at least an equivalent margin of safety as currently defined in the BASES of the applicable Technical Specification sections.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

ENVIRONMENTAL ANALYSIS

An environmental assessment is not required for the proposed change because the requested change conforms to the criteria for actions eligible for categorical exclusion as specified in 10 CFR 51.22(c)(9). The requested change will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed above. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change does not involve a significant increase in the individual or cumulative occupational radiation exposure.