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U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
REQUEST FOR ADDITIONAL INFORMATION FOR  
PROPOSED AMENDMENT NO. 211 TO UNIT 2  
LICENSE NPF-22: MCPR SAFETY LIMITS  
AND REFERENCE CHANGES  
PLA-5563**

**Docket No. 50-388**

- Reference: 1) PLA-5467, R. L. Anderson (PPL) to USNRC, "Proposed Amendment No. 211 to Unit 2 License NPF-22: MCPR Safety Limits and Reference Changes", dated July 17, 2002.*
- 2) PLA-5520, B. L. Shriver (PPL) to USNRC, "Supplement to Proposed Amendment No. 211 to Unit 2 License NPF-22: MCPR Safety Limits and Reference Changes", dated October 30, 2002.*
- 3) USNRC to B. L. Shriver (PPL), "Susquehanna Steam Electric Station, Unit 2 – Request for Additional Information (RAI) – Minimum Critical Power Ratio Safety Limits and Reference Changes (TAC No. MB5610), dated December 9, 2002.*

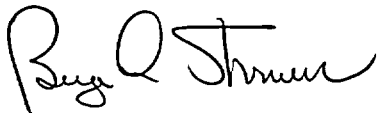
The purpose of this letter is to provide a response to the NRC Request for Additional Information (RAI), (Reference 3). The RAI refers to PPL's Proposed Amendment No. 211 to Unit 2 License No. NPF-22 relating to MCPR Safety Limits and Reference Changes. Specifically, Proposed Amendment No. 211 identified changes to the Unit 2 Cycle 12 (U2C12) MCPR Safety Limits in Technical Specification (TS) Section 2.1.1.2, changes to the references in TS Section 5.6.5.b, and a change to the Design Features in TS Section 4.2.1, (Reference 1). Supplemental information related to TS Section 5.6.5 was provided by Reference 2 in late October 2002.

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Attachment 1 to this letter contains the RAI questions and responses as prepared by PPL. These questions and responses were previously discussed via telecon between NRC and PPL on November 20, 2002.

Any questions regarding this additional information should be directed to Mr. Duane L. Filchner at (610) 774-7819.

Sincerely,

A handwritten signature in black ink, appearing to read "B. L. Shriver". The signature is fluid and cursive, with the first name "B. L." and the last name "Shriver" clearly distinguishable.

B. L. Shriver

Attachments: Affidavit

Attachment 1 - Response to NRC's Request for Additional Information

copy: NRC Region I

Mr. D. J. Allard, PA DEP

Mr. T. G. Colburn, NRC Sr. Project Manager

Mr. S. Hansell, NRC Sr. Resident Inspector

Mr. R. Janati, DEP/BRP

**BEFORE THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION**

In the Matter of \_\_\_\_\_ :

PPL Susquehanna, LLC:

Docket No. 50-388

**REQUEST FOR ADDITIONAL INFORMATION REGARDING  
PROPOSED AMENDMENT NO. 211 TO UNIT 2  
LICENSE NPF-22: MCPR SAFETY LIMITS  
AND REFERENCE CHANGES**

Licensee, PPL Susquehanna, LLC, hereby files a revision to its Facility Operating License No. NPF-22 dated March 23, 1984.

This amendment involves a revision to the Susquehanna SES Unit 2 Technical Specifications.



PPL Susquehanna, LLC

By:

B.L. Shriver

Senior Vice-President and Chief Nuclear Officer

Sworn to and subscribed before me  
this 18<sup>th</sup> day of December, 2002.

  
\_\_\_\_\_  
Notary Public

Notarial Seal  
Nancy J. Lannen, Notary Public  
Allentown, Lehigh County  
My Commission Expires June 14, 2004

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**Attachment 1 to PLA-5563  
Response to NRC's  
Request for Additional Information**

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## **Attachment 1 – Response to RAI**

### **Request for Additional Information for Proposed Amendment No. 211 to Unit 2 License NPF-22: MCPR Safety Limits and Reference Changes**

#### **NRC Question 1:**

Identify any differences between the reference core loading pattern for the analysis and the real core loading pattern. Provide the procedure of how to deal with this difference if it does occur.

#### **PPL Response:**

There is no recent experience where the Susquehanna real core loading pattern differed from the reference core loading pattern as contained in the FSAR. The current U2C11 core loading pattern is in Section 4 of the Susquehanna Final Safety Analysis Report. Should a core loading pattern different from the reference be deemed warranted, PPL would assess the change in accordance with the PPL procedure for 10 CFR 50.59 to determine if the change requires NRC review and approval prior to implementation.

For Unit 2 Cycle 11 (U2C11), Enclosure E to PLA-5169, (Reference 1.1 below), specifies that U2C11 has 300 fresh ATRIUM™-10 fuel assemblies, 280 once-burned ATRIUM™-10 fuel assemblies, and 184 twice-burned ATRIUM™-10 fuel assemblies.

For Unit 2 Cycle 12 (U2C12), Attachment 5 to PLA-5467, (Reference 1.2 below), specifies that U2C12 contains 284 fresh ATRIUM™-10 fuel assemblies, 300 once-burned ATRIUM™-10 fuel assemblies, and 180 twice-burned ATRIUM™-10 fuel assemblies.

In the industry, core loading pattern changes have been necessitated as a result of fuel failures. Susquehanna has not experienced a fuel failure since 1992.

#### **References:**

- 1.1 PLA-5169, R. G. Byram (PPL) to USNRC, "Proposed Amendment No. 194 to License NPF-22: MCPR Safety Limits", dated March 20, 2000.

1.2 PLA-5467, B. L. Shriver (PPL) to USNRC, "Proposed Amendment No. 211 to Unit 2 License NPF-22: MCPR Safety Limits and Reference Changes", dated July 17, 2002.

**NRC Question 2:**

On page 1, attachment 1 of your submittal, you state that NRC approval of the previously used computer code ANFB-10 critical power correlation required a factor of 2 to be applied to the number of pins calculated to be in boiling transition for the Safety Limit calculation. Provide a detailed basis of this statement and identify the impact on the Safety Limit calculation.

**PPL Response:**

The basis for the statement with respect to the need for a factor of 2 on number of pins in boiling transition required for the ANFB correlation is found in the response to an RAI given in Reference 2.1, Supplement 2, page 7.

The previously used NRC approved ANFB critical power correlation had a mean bias in the predicted to measured ratio of critical power that was slightly greater than 1.0 (i.e., 1.003) (Reference 2.1 Supplement 2, page 7 below). This ratio of 1.003 means that the ANFB correlation on average would result in a predicted critical power slightly higher than the actual critical power (i.e., nonconservative). To compensate for this slight non-conservatism in the ANFB correlation mean, a factor of 2 was applied to the number of pins in boiling transition when calculating the MCPR Safety Limit.

For the currently used NRC approved ANFB-10 critical power correlation, the mean bias in the ratio of predicted to measured critical power is less than 1.0 (i.e., 0.9985), (Reference 2.2, Rev. 0 Page 4-2 below). Because the correlation mean is conservative, there is no need to apply any additional conservative factor. The impact on the number of pins in boiling transition is that there is no factor of 2 applied to the number of rods in boiling transition with the ANFB-10 based calculation. The resulting ANFB-10 based MCPR Safety Limit still assures that at least 99.9% of the fuel rods are expected to avoid boiling transition during normal operation and anticipated operational occurrences.

References:

- 2.1 ANF-524 (P)(A), Revision 2 and Supplements, "Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors", November 1990.
- 2.2 EMF-1997 (P)(A), Revision 0, "ANFB-10 Critical Power Correlation," and EMF-1997 (P)(A) Supplement 1 Revision 0, "ANFB-10 Critical Power Correlation: High Local Peaking Results", July 1998.