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SEP 16 2003

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

**SUSQUEHANNA STEAM ELECTRIC STATION  
NOTIFICATION OF THE USE OF NRC PREVIOUSLY  
APPROVED METHODOLOGY IN ACCORDANCE WITH  
GENERIC LETTER 83-11 SUPPLEMENT 1  
PLA-5664**

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**Docket Nos. 50-387  
and 50-388**

- References: 1) PL-NF-87-001-A, "Qualification of Steady State Core Physics Methods for BWR Design and Analysis," dated April 28, 1988.*
- 2) PL-NF-90-001-A, "Application of Reactor Analysis Methods for BWR Design and Analysis," including Supplements 1-A, 2-A, and 3-A.*
- 3) EMF-2158(P)(A), "Evaluation of CASMO-4 and MICROBURN-B2," dated October, 1999.*

This letter provides the notification required by Generic Letter 83-11, Supplement 1, "Licensee Qualification for Performing Safety Analyses" prior to using an approved code or method to perform safety-related evaluations. The subject generic letter supplement provides a generic set of guidelines that, if implemented, provide the basis for NRC acceptance of a licensee's qualification to use an approved code or method to perform safety-related evaluations. PPL Susquehanna, LLC, (PPL) has reviewed the guidelines provided in the generic letter supplement and is in compliance with all of the requirements. Each aspect of compliance is addressed in Attachment 1.

PPL intends to begin using selected steady-state analysis software and applications, which have been previously approved by the NRC, and are documented in Reference 3. Specifically, PPL intends to use the CASMO-4 and MICROBURN-B2 code system to perform Reload Core and Bundle Design, Shutdown Margin Analysis and MCPR Safety Limit Input Generation. Optionally, PPL may continue to use the methodology that has been specifically approved for our use as documented in References 1 and 2.

PPL intends to use the Reference 3 methodology starting with the analysis of Unit 1 Cycle 14. This cycle is currently planned to begin operation in the spring of 2004, thus meeting the 3-month notification guideline established in the generic letter supplement.

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Should you have any questions regarding this notification, please contact Mr. Duane L. Filchner at (610)-774-7819.

Sincerely,

A handwritten signature in cursive script, appearing to read "B. L. Shriver".

B. L. Shriver

Attachment 1 – PPL Compliance with Generic Letter 83-11 Supplement 1

copy: NRC Region I  
Mr. S. L. Hansell, NRC Sr. Resident Inspector  
Mr. R. V. Guzman, NRC Project Manager  
Mr. R. Janati, DEP/BRP

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**Attachment 1 to PLA-5664**  
**PPL Compliance to Generic Letter 83-11**  
**Supplement 1**

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## **Attachment 1 – PPL Compliance to Generic Letter 83-11 Supplement 1**

### **1.0 Background**

PPL Susquehanna, LLC, (PPL) has been performing both core design and licensing analyses using methods which have been submitted to and approved by the NRC since the early 1990s. The methodology and applications to perform this work are documented in References 1 and 2.

While these methods continue to provide conservative operating limits for use at Susquehanna, advancements have been made in methods available for reactor physics analysis. PPL is planning to use new “state-of-the-art” methods being used by Framatome, ANP. This software set is based on the improved lattice physics code, CASMO-4 (developed by Studsvik), and the improved steady state nodal analysis code, MICROBURN-B2 (developed by Framatome).

NRC Generic Letter 83-11, Supplement 1, provides a set of guidelines endorsed by the NRC which can be used to qualify licensees to use previously NRC approved methodology. PPL intends to begin using selected Framatome steady-state analysis software and applications, which have been previously approved by the NRC and are documented in Reference 3. Specifically, PPL intends to use the CASMO-4 and MICROBURN-B2 code system as documented in Reference 3 to perform Reload Core and Bundle Design, Shutdown Margin Analysis and MCPR Safety Limit Input Generation.

PPL is only applying the steady-state portion of the methodology described in Reference 3. Framatome has successfully applied this methodology to a number of different reactors and fuel designs, including mixed cores (i.e. cores with both Framatome and other vendors' fuel designs). Optionally, PPL may continue to use the methodology that has been specifically approved for our use as documented in References 1 and 2.

PPL has reviewed the guidelines provided in Generic Letter 83-11, Supplement 1, and complies with all of the requirements. Each of the aspects of the generic letter is addressed below. PPL intends to use this methodology starting with the analysis of Unit 1 Cycle 14. This cycle is currently planned to begin operation in spring of 2004, thus meeting the 3-month notification guideline established in the generic letter supplement.

## **2.0 Eligibility**

The CASMO-4 and MICROBURN-B2 methodology used by Framatome for Reload Design and Licensing Analysis described in Reference 3 has been reviewed and approved by the NRC. This review and associated SER restrictions are documented as part of the Framatome report. PPL intends to use the methodology as approved by the NRC, observing all applicable SER restrictions. No changes to the methodology or applications as approved by the NRC will be made.

## **3.0 Application Procedures**

PPL has revised our in-house Technical Instructions for the applications to ensure consistency with the NRC approved application methodology. Currently, PPL has developed a full set of Technical Instructions and Procedures which provide sufficient detail to ensure that all design and licensing analyses are performed consistent with current NRC approved methodology. The procedures provide clear and concise instructions on how to apply the software for licensing analyses.

## **4.0 Training and Qualification of Licensee Personnel**

During the implementation of the CASMO-4 and MICROBURN-B2 code, vendor training in the use of the new methodology from both Studsvik and Framatome was provided. The training programs were developed and approved in accordance with the Nuclear Department Training Procedures to ensure the appropriate level of detail in the training material. Subject matter experts from both Studsvik and Framatome were present to provide the training. Training exercises were developed to help with the technology transfer from Framatome to PPL personnel and ensure a good working knowledge of the codes and methods. Training records, available for audit, document the training material, personnel attendance and comprehension of the material.

The Nuclear Fuels Engineering organization, which is responsible for the design and licensing work, has an established personnel qualification procedure. This procedure is used to identify individual engineers who have achieved qualifications to perform the various design and licensing applications and ensure only qualified engineers perform design and licensing analyses. As new methodologies are implemented, engineers must be qualified on the new methodology prior to being assigned the task to perform independent design or analysis work.

## **5.0 Comparison Calculations**

Prior to use of the new CASMO-4 and MICROBURN-B2 methodology a complete set of benchmark calculations for all past Susquehanna operating cycles was performed and documented. These benchmark calculations were performed by in-house engineers to ensure thorough understanding of the code, the associated methodology, and the input requirements. CASMO-4 and MICROBURN-B2 models were established for all of the past Susquehanna cycles to model the available operating data. Both hot operating and cold critical data was used in the benchmarks. The data from these benchmark calculations were analyzed for trends and anomalies. Qualified PPL engineers documented the results from the calculations with independent internal reviews. The results demonstrate both PPL's ability to use the software and the equivalence of the PPL modeling approach to that used by Framatome.

## **6.0 Quality Assurance and Change Control**

PPL has an established Quality Assurance program, which complies with all of the applicable requirements of Appendix B to Part 50 of Title 10 of the Code of Federal Regulations. This program is documented in internal company department and functional unit procedures. All tasks and records associated with the qualification of the methods and applications being implemented are subject to this Quality Assurance program. This includes not only the documentation for the various design and licensing analyses, but also the software Quality Assurance records as well. All software used to support Quality Related work is controlled by internal Software Quality Assurance procedures which comply with the 10 CFR 50, Appendix B requirements.

As part of the Quality Assurance Program, Framatome will notify PPL of any software errors, via Condition Reports or Part 21 notifications. Error corrections, or code upgrades that do not involve a change to the methodology are provided to PPL along with associated user documentation. These software updates are evaluated under PPL's software control procedure and implemented as appropriate. Impacts of all software changes are evaluated and documented. PPL procedures also require software vendors to be notified of any code or methodology errors that are identified by PPL.