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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop OP1-17
Washington, DC 20555-0001

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT NO. 282 TO
FACILITY OPERATING LICENSE NPF-14:
PROPOSED CHANGE TO TECHNICAL SPECIFICATION 2.1.1.2
MCPR SAFETY LIMIT
SUPPLEMENTAL INFORMATION
PLA-5976 **Docket No. 50-387**

Reference: *PLA-5967, B. T. McKinney (PPL) to Document Control Desk (USNRC), "Proposed Amendment No. 282 to Unit 1 Facility Operating License NPF-14 Proposed Change to Technical Specification 2.1.1.2 MCPR Safety Limit," dated October 14, 2005.*

In accordance with Reference 1, PPL committed to provide confirmation of the adequacy of the channel bow assumption used in the Minimum Critical Power Ratio Safety Limit (MCPR SL) calculation for the redesigned core prior to the restart of Unit 1. The method describing how we determine the MCPR SL adequacy under these conditions is contained in the Attachment to this letter.

PPL has reviewed the No Significant Hazards Consideration and the Environmental Consideration submitted with Reference 1. As a result, we have determined that there are no changes required to either of these documents as a result of providing this additional information.

As discussed in the NRC public meeting on October 12, 2005, and subsequently with the NRC Project Manager for Susquehanna, we respectfully request NRC to complete the review and approval of the proposed MCPL SL change to support unit startup immediately following implementation of the redesigned U1C14 core.

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

A001

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 10-21-05

B. T. McKinney

Attachment: Confirmation of Channel Bow Assumption Adequacy

cc: NRC Region I
Mr. B. A. Bickett, NRC Sr. Resident Inspector
Mr. R. V. Guzman, NRC Project Manager
Mr. R. Janati, DEP/BRP

ATTACHMENT TO PLA-5976

CONFIRMATION OF CHANNEL BOW ASSUMPTION ADEQUACY

Confirmation of Channel Bow Assumption Adequacy

PPL will use the following approach to validate the fuel channel bow assumed in the Unit 1 Cycle 14 MCPR Safety Limit (SL) calculation through end-of-cycle 14 and to assure the calculated MCPR SL remains valid. The proposed MCPR SL was calculated assuming two-times the mean bow normally used in the Framatome MCPR SL calculation, in order to have a high probability of demonstrating the conservatism of the channel bow assumption.

The approach uses a combination of prior operating experience and fuel channel measurements, plus a significant number of fuel channel measurements to be performed during an impending maintenance outage. The data will be assessed to assure that the channel bow distribution used in the statistical MCPR SL calculation for Unit 1 Cycle 14 is appropriate. The Unit 1 Cycle 14 core contains fuel that can be divided, or "batched," based on the cycle it was first inserted into the reactor (i.e., Unit 1 Cycle 12, Unit 1 Cycle 13, and Unit 1 Cycle 14). Each "batch" will be evaluated individually to demonstrate that it meets (or is bounded by) the channel bow assumptions in the Unit 1 Cycle 14 MCPR Safety Limit calculation.

Unit 1 Cycle 12 Fuel

Expectation:

The Unit 1 Cycle 12 fuel is expected to remain within the Framatome-ANP fuel channel bow database and within the bow assumed for the U1C14 MCPR SL analysis following the impending maintenance outage.

Basis for Expectation at Restart Following Maintenance Outage

PPL performed fuel channel measurements during the spring outages of 2004 and 2005 on discharged bundles with the same channel material type and similar operating histories as the Unit 1 Cycle 12 fuel scheduled to remain in U1C14. Based on the channel measurements from these similarly designed and operated fuel bundles, the Unit 1 Cycle 12 fuel is expected to remain within the Framatome-ANP fuel channel bow database and within the bow assumed for the U1C14 MCPR SL analysis.

Due to their higher depletion, the U1C12 bundles are significantly lower in power (higher MCPRs) than the U1C14 bundles. As a result, they do not contribute any pins in boiling transition for the MCPR SL calculation. However, since their bow affects other bundles, the proposed MCPR SL was calculated assuming the fuel surrounding the U1C14 fuel has two-times the mean bow normally used in the MCPR SL calculation.

Acceptability to EOC

Due to the short remaining cycle length and the lack of significant additional control history that the fuel will experience, it is concluded that the Unit 1 Cycle 12 fuel will remain within the Framatome-ANP fuel channel bow database and within the bow assumed for the U1C14 MCPR SL analysis through the end of cycle for U1C14.

Unit 1 Cycle 14 Fuel

Expectation:

The Unit 1 Cycle 14 fuel is expected to remain within the bow assumed for the U1C14 MCPR SL analysis following the impending maintenance outage.

Basis for Expectation at Restart Following Maintenance Outage

The Unit 1 Cycle 14 fuel exposures and the control history duration were limited since the fuel will have been in the core for less than one cycle. This limits the amount of bow that would be expected.

To directly investigate the bow performance of the U1C14 fuel channels, channels from several Unit 1 Cycle 14 fuel bundles will be characterized (i.e., the bow will be measured) during the maintenance outage. These Unit 1 Cycle 14 fuel bundles are currently located in "slow-to-settle" control cell locations.

In addition, the proposed MCPR SL was calculated assuming the U1C14 fuel and the fuel adjacent to the U1C14 fuel has two-times the mean bow normally used in the Framatome MCPR SL calculation, in order to have a high probability of demonstrating the conservatism of the channel bow assumption.

Acceptability to EOC

Given the success of the above evaluation, and due to the short remaining cycle length and the lack of significant additional control history that the fuel will experience, it is concluded that the Unit 1 Cycle 14 fuel will remain within the Framatome-ANP fuel channel bow database and within the bow assumed for the U1C14 MCPR SL analysis through the end of cycle for U1C14.

Unit 1 Cycle 13 Fuel

Expectation:

The "as left" Unit 1 Cycle 13 fuel (following rechanneling and replacement) is expected to remain within the Framatome-ANP fuel channel bow database and within the bow assumed for the U1C14 MCPR SL analysis following the impending maintenance outage.

Basis for Expectation at Restart Following Maintenance Outage

Unit 1 Cycle 13 fuel bundles from control cells experiencing friction will be characterized. A portion of the Unit 1 Cycle 13 fuel bundles with significant bow will be re-channeled or replaced with previously characterized, previously discharged ATRIUM™-10 fuel bundles with less bow. The Unit 1 Cycle 13 fuel bundles that are being re-channeled or replaced will be taken from control cells exhibiting friction. This approach will significantly lower the average bow of the "as left" Unit 1 Cycle 13 fuel bundles.

The data from the Unit 1 Cycle 13 fuel bundle measurements will also provide the ability to conservatively determine the bow distribution of the Unit 1 Cycle 13 fuel bundles that are not re-channeled or replaced. The mean and standard deviation from these fuel assemblies will be compared to the mean and standard deviation assumed in the MCPR SL analysis, and an evaluation will be performed to demonstrate that the MCPR SL analysis remains valid.

Due to their higher depletion, the U1C13 bundles are lower in power (higher MCPRs) than the U1C14 bundles. As a result, they do not contribute any pins in boiling transition for the MCPR SL calculation.

Acceptability to EOC

Given the success of the above evaluation, and due to the short remaining cycle length and the lack of significant additional control history that the fuel will experience, it is concluded that the Unit 1 Cycle 13 fuel will remain within the bow assumed for the U1C14 MCPR SL analysis through the end of cycle for U1C14. Additionally, a conservative projection based on the U1C13 fuel measured bow will be applied to the Unit 1 Cycle 13 fuel to further ensure that the MCPR SL analysis remains valid through the Unit 1 Cycle 14 end of cycle exposure.

Conclusion

Based on the approach described above involving channel bow measurements, rechanneling and replacement of fuel that has higher bow channels, and the value of bow assumed in the MCPR SL analysis, it is expected that the evaluation will validate the fuel channel bow assumed in the Unit 1 Cycle 14 MCPR Safety Limit (SL) calculation through end-of-cycle 14 and assure the calculated MCPR SL remains valid.