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U. S. Nuclear Regulatory Commission  
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10 CFR 50.46

**SUSQUEHANNA STEAM ELECTRIC STATION**  
**10 CFR 50.46 ANNUAL REPORT**  
**PLA-7870**

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

- References*
1. "Susquehanna Steam Electric Station (SSES) 10 CFR 50.46 – Annual Report PLA-7770," dated June 10, 2019 (ADAMS Accession No. ML19161A131)
  2. Framatome Record FS1-0048094, Revision 1.0, "10 CFR 50.46 PCT Error Reporting for the Susquehanna Units," dated February 26, 2020

Pursuant to the reporting requirements of 10 CFR 50.46(a)(3)(ii), Susquehanna Nuclear, LLC is submitting the Emergency Core Cooling System (ECCS) evaluation model annual report for Susquehanna Steam Electric Station (SSES) Units 1 and 2. The attached report summarizes the nature of and estimated effect of any modeling changes or error corrections in the ECCS model for the period April 22, 2019 through February 26, 2020 for SSES Units 1 and 2.

Since the last 10 CFR 50.46 annual report dated June 10, 2019 (Reference 1), there were two non-impacting Peak Cladding Temperature (PCT) changes reported to SSES resulting from a modeling change or error correction to the ECCS evaluation method. The current licensing basis PCT remains in compliance with 10 CFR 50.46 requirements.

There are no new regulatory commitments contained in this submittal.

If you have any questions regarding this letter, please contact Ms. Melisa Krick, Manager - Nuclear Regulatory Affairs, at (570) 542-1818.

A handwritten signature in black ink, appearing to read "Derek Jones".

Derek Jones for Kevin Cimorelli;  
K. Cimorelli

Attachment – 10 CFR 50.46 ECCS Evaluation Model Annual Report

Copy: NRC Region I  
Ms. S. Goetz, NRC Project Manager  
Mr. M. Rossi, NRC Resident Inspector  
Mr. M. Shields, PA DEP/BRP

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**Attachment to PLA- 7870**

**10 CFR 50.46 ECCS Evaluation Model  
Annual Report**

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**BACKGROUND**

In accordance with 10 CFR 50.46(a)(3)(ii), this annual report summarizes the nature of and estimated effect of any modeling changes or errors corrections in the ECCS model for the period April 22, 2019 through February 26, 2020 for SSES Units 1 and 2.

**DISCUSSION**

The ECCS performance evaluation method applicable to both SSES Units 1 and 2 is the Framatome EXEM BWR-2000 LOCA (Loss of Coolant Accident) Methodology.

For the reporting period of April 22, 2019 through February 26, 2020, there have been two reportable 10 CFR 50.46 modeling changes or error corrections to the ECCS evaluation method since the previous 10 CFR 50.46 report (Reference 1). Both errors have been captured in Framatome's Corrective Action Program.

An error was identified in the Pellet-Cladding Mechanical Interaction routines in RODEX4. RODEX4 was used in the assessment of thermal conductivity degradation impact on LOCA; this was documented in PLA-6870 dated June 21, 2012. This RODEX4 code error is estimated to have zero impact on PCT.

Two errors were identified in the heatup analysis automatic code, AUTOHUP: 1) AUTOHUP incorrectly inputs the blanket lengths for part length rods in RODEX2-2A for ATRIUM 10XM fuel and 2) AUTOHUP does not correctly calculate effective plenum length to account for the pellet land taper and dish void volume. The blanket length error does not impact ATRIUM 10 fuel, and, therefore, does not apply to SSES. The AUTOHUP effective plenum length error is estimated to have zero impact on PCT.

The total change listed in the last column of Table 1 does not meet the significance threshold for change (50°F) identified in 10 CFR 50.46(a)(3)(i) for which a 30-day report is required.

## **IMPACT**

Table 1  
Non-Zero PCT Changes Resulting from Modeling Changes / Error Corrections in  
Calculated ECCS Performance  
Evaluation Model: Framatome EXEM BWR-2000 LOCA Methodology

Description of Change/Error	Estimated $\Delta$ PCT (°F)	Absolute Value of $\Delta$ PCT (°F)
HUXY capability enhancement to model each fuel rod individually (ADAMS Accession No. ML17158B382)	-1	1
Updated steam dryer information (ADAMS Accession No. ML19161A131)	+5	5
Total Since Initial PCT (Reference 2)	+4	6

## **CONCLUSION**

As documented in Table 1, the SSES Units 1 and 2 Loss of Coolant Accident Analysis PCT remains in compliance with 10 CFR 50.46(b)(1), which requires that the PCT not exceed 2200°F.