

June 12, 2023

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

10 CFR 50.46

SUSQUEHANNA STEAM ELECTRIC STATION
10 CFR 50.46 ANNUAL REPORT
PLA-8065

Docket Nos. 50-387
and 50-388

- References:*
- 1) *“Susquehanna Steam Electric Station 10 CFR 50.46 Annual Report,” dated June 10, 2022 (ADAMS Accession No. ML22161A074).*
 - 2) *Framatome Record FSI-0067126, Revision 1.0, “10 CFR 50.46 PCT Error Reporting for the Susquehanna Units – April 2022 to April 2023,” dated April 26, 2023.*

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 reports summarize the nature of and estimated effect of any modeling changes or error corrections in the ECCS models.

Attachment 1 provides a summary of the Framatome EXEM BWR-2000 LOCA (Loss of Coolant Accident) Methodology which is applicable to ATRIUM-10 fuel for the period April 10, 2022, through April 9, 2023, for SSES Units 1 and 2. Since the last 10 CFR 50.46 annual report dated June 10, 2022 (Reference 1), there were no new Peak Cladding Temperature (PCT) changes reported to SSES resulting from a modeling change or error correction to the EXEM BWR-2000 LOCA Methodology. The current licensing basis PCT remains in compliance with 10 CFR 50.46 requirements.

Attachment 2 provides a summary of the Framatome AURORA-B LOCA Methodology which is applicable to ATRIUM-11 fuel for the period April 10, 2022, through April 9, 2023, for SSES Units 1 and 2. Since the last 10 CFR 50.46 annual report dated June 10, 2022 (Reference 1), there was one non-impacting PCT change reported to SSES resulting from a modeling change or error correction to the AURORA-B LOCA Methodology. The current licensing basis PCT remains in compliance with 10 CFR 50.46 requirements.

There are no new or revised 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.



E. Casulli

Attachments:

1. 10 CFR 50.46 ECCS Evaluation Model Annual Report for ATRIUM-10 Fuel
2. 10 CFR 50.46 ECCS Evaluation Model Annual Report for ATRIUM-11 Fuel

Copy: NRC Region I
Ms. A. Klett, NRC Project Manager
Mr. C. Highley, NRC Senior Resident Inspector
Mr. M. Shields, PA DEP/BRP

Attachment 1 to PLA-8065

**10 CFR 50.46 ECCS Evaluation Model
Annual Report for ATRIUM-10 Fuel**

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 error corrections in the ECCS model for the period April 10, 2022, through April 9, 2023.

DISCUSSION

ATRIUM-10 and ATRIUM-11 fuel was co-loaded in SSES Units 1 and 2 for the reporting period April 10, 2022, through April 9, 2023. The ECCS performance evaluation method applicable to ATRIUM-10 fuel for both SSES Units 1 and 2 is the Framatome EXEM BWR-2000 LOCA Methodology.

For the reporting period of April 10, 2022, through April 9, 2023, there have been no 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).

The total cumulative 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 Δ PCT (°F)	Absolute Value of Δ 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, SSES Units 1 and 2 ATRIUM-10 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.

Attachment 2 to PLA-8065

**10 CFR 50.46 ECCS Evaluation Model
Annual Report for ATRIUM-11 Fuel**

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 error corrections in the ECCS model for the period April 10, 2022, through April 9, 2023.

DISCUSSION

ATRIUM-10 and ATRIUM-11 fuel was co-loaded in SSES Units 1 and 2 for the reporting period April 10, 2022, through April 9, 2023. The ECCS performance evaluation method applicable to ATRIUM-11 fuel is the Framatome AURORA-B LOCA Methodology.

For the period of April 10, 2022, through April 9, 2023, there was one reportable 10 CFR 50.46 modeling change or error correction to the ECCS evaluation method.

1. A code error was identified in MICROBURN-B2 associated with the input to the ACE critical power correlation subroutine when an explicit water rod model is used. MICROBURN-B2 is used to generate the power distribution in the AURORA-B LOCA Methodology. This error is estimated to have zero impact on PCT (Reference 2).

The error has been captured in Framatome's Corrective Action Program. This individual item 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.

The total cumulative change listed in the last column of Table 2 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 2
Non-Zero PCT Changes Resulting from Modeling Changes / Error Corrections in
Calculated ECCS Performance
Evaluation Model: Framatome AURORA-B LOCA Methodology

Description of Change/Error	Estimated Δ PCT (°F)	Absolute Value of Δ PCT (°F)
Pellet-Cladding Mechanical Interaction routines in RODEX4 (ADAMS Accession No. ML21161A005)	-1	1
Lower tie plate bypass flow hole size increase (ADAMS Accession No. ML21161A005)	-3	3
Upper tie plate loss coefficient used in MICROBURN-B2 (ADAMS Accession No. ML21161A005)	+5	5
Hot wall effect temperature (ADAMS Accession No. ML22161A074)	+5	5
Total Since Initial PCT (Reference 2)	+6	14

CONCLUSION

As documented in Table 2, SSES Units 1 and 2 ATRIUM-11 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.