



March 13, 2024

L-2024-011
10 CFR 50.46

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

Re: Florida Power & Light Company
Turkey Point Units 3 and 4, Docket Nos. 50-250, 50-251

Florida Power & Light Company
St. Lucie Units 1 and 2, Docket Nos. 50-335, 50-389

NextEra Energy Seabrook, LLC
Seabrook Station, Docket No. 50-443

NextEra Energy Point Beach, LLC
Point Beach Units 1 and 2, Docket Nos. 50-266, 50-301

10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core
Cooling System Models or Applications

Pursuant to 10 CFR 50.46(a)(3)(ii), the nature of any change to or error discovered in the evaluation models for emergency core cooling systems (ECCS), or in the application of such models, that affect the fuel cladding temperature calculations for Turkey Point Nuclear Plant, Units 3 and 4; and St. Lucie Nuclear Plant, Units 1 and 2; Seabrook Station; and Point Beach Nuclear Plant, Units 1 and 2 are reported in the attachments to this letter by Florida Power & Light Company (FPL), on behalf of itself and its affiliates, NextEra Energy Seabrook, LLC and NextEra Energy Point Beach, LLC. The data interval for this report is from January 1, 2023 through December 31, 2023.

Evaluations of each reported error have concluded that re-analysis was not required.

This letter contains no new or revised regulatory commitments.

Should you have any questions regarding this report, please contact Mr. Kenneth Mack, Fleet Licensing Manager, at (561) 904-3635.

Very truly yours,



Steve Catron
Licensing and Regulatory Compliance Director - Nuclear Fleet
Florida Power & Light Company

Attachments (4)

cc: USNRC Regional Administrator, Region I
USNRC Regional Administrator, Region II
USNRC Regional Administrator, Region III

USNRC Project Manager, Seabrook Station
USNRC Project Manager, St. Lucie Nuclear Plant
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Project Manager, Point Beach Nuclear Plant

USNRC Senior Resident Inspector, Seabrook Station
USNRC Senior Resident Inspector, St. Lucie Nuclear Plant
USNRC Senior Resident Inspector, Turkey Point Nuclear Plant
USNRC Senior Resident Inspector, Point Beach Nuclear Plant

ATTACHMENT 1

**Florida Power & Light Company
Turkey Point Units 3 and 4**

Table 1: Turkey Point Unit 3 and 4 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Engineering Summary Report of the Turkey Point Units 3 and 4 Loss-of-Coolant Accident (LOCA) Analysis with the FULL SPECTRUM LOCA (FSLOCA) Methodology," WCAP-18597-P, Revision 0, November 2020.

Evaluation Model PCT: 1475 °F (Reference 1)

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to 12/31/2022	N/A ¹	N/A
10 CFR 50.46 Changes or Errors Corrections – Year 2023	0 °F	0 °F
Sum of 10 CFR 50.46 Changes or Errors Corrections	0 °F	0 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1475 °F < 2200 °F
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Summary of 2023 Changes and Errors:

Vapor/Continuous Liquid Interfacial Drag Coefficient In Churn-Turbulent Flow Regime:

Two deficiencies were identified in the calculation of the churn-turbulent vapor/continuous liquid interfacial drag coefficient calculation within WCOBRA/TRAC-TF2 due to the potential calculation of a negative critical liquid fraction. The negative liquid crystal fraction results in an over-prediction of the vapor/continuous liquid interfacial area and a negative vapor/continuous liquid interfacial drag coefficient which leads to a significantly large interfacial drag coefficient. These closely-related group of deficiencies was qualitatively evaluated, and the nature of the deficiencies leads to an estimated peak cladding temperature impact of 0 °F.

Reference:

1. Letter from U.S. Nuclear Regulatory Commission to B. Coffey, "Turkey Point Nuclear Generating Units Nos. 3 and 4 – Issuance of Amendments Nos. 296 and 289 Regarding Implementation of Full Spectrum Loss-of-Coolant Accident (FSLOCA) Methodology (EPID L-2021-LLA-0070)," May 24, 2022 (ML22028A066).

¹ FSLOCA is a new methodology; there is no information to report from the previous year.

Table 2: Turkey Point Unit 3 and 4 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Engineering Summary Report of the Turkey Point Units 3 and 4 Loss-of-Coolant Accident (LOCA) Analysis with the FULL SPECTRUM LOCA (FSLOCA) Methodology," WCAP-18597-P, Revision 0, November 2020.

Evaluation Model PCT: 1981 °F (Reference 1)

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to 12/31/2022	N/A ¹	N/A
10 CFR 50.46 Changes or Errors Corrections – Year 2023	0 °F	0 °F
Sum of 10 CFR 50.46 Changes or Errors Corrections	0 °F	0 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1981 °F < 2200 °F
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Summary of 2023 Changes and Errors:

Vapor/Continuous Liquid Interfacial Drag Coefficient In Churn-Turbulent Flow Regime:

Two deficiencies were identified in the calculation of the churn-turbulent vapor/continuous liquid interfacial drag coefficient calculation within WCOBRA/TRAC-TF2 due to the potential calculation of a negative critical liquid fraction. The negative liquid crystal fraction results in an over-prediction of the vapor/continuous liquid interfacial area and a negative vapor/continuous liquid interfacial drag coefficient which leads to a significantly large interfacial drag coefficient. These closely-related group of deficiencies was qualitatively evaluated, and the nature of the deficiencies leads to an estimated peak cladding temperature impact of 0 °F.

Reference:

1. Letter from U.S. Nuclear Regulatory Commission to B. Coffey, "Turkey Point Nuclear Generating Units Nos. 3 and 4 – Issuance of Amendments Nos. 296 and 289 Regarding Implementation of Full Spectrum Loss-of-Coolant Accident (FSLOCA) Methodology (EPID L-2021-LLA-0070)," May 24, 2022 (ML22028A066).

¹ FSLOCA is a new methodology; there is no information to report from the previous year.

ATTACHMENT 2

**Florida Power & Light Company
St. Lucie Units 1 and 2**

Table 1: St. Lucie Unit 1 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Framatome, "PWR Small Break LOCA Evaluation Model, S-RELAP5 Based," EMF-2328(P)(A) Revision 0 as supplemented by ANP-3000(P), Revision 0.

Evaluation Model PCT: 1828°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	+24 °F	84 °F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	+24 °F	84 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1852 °F < 2200 °F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 2: St. Lucie Unit 1 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Framatome, "Realistic Large Break LOCA Methodology for Pressurized Water Reactors," EMF-2103(P)(A) Revision 0 as supplemented by ANP-2903(P), Revision 1.

Evaluation Model PCT: 1788°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	+6 °F	6°F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	+6 °F	6°F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1794 °F < 2200 °F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 3: St. Lucie Unit 2 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Framatome, "PWR Small Break LOCA Evaluation Model, S-RELAP5 Based," EMF-2328(P)(A) Revision.0.

Evaluation Model PCT: 2057°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	-279°F	393 °F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	-279°F	393 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1778 °F < 2200 °F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 4: St. Lucie Unit 2 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Framatome, "Realistic Large Break LOCA Methodology for Pressurized Water Reactors," EMF-2103(P)(A) Revision 0.

Evaluation Model PCT: 1732°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	0 °F	0 °F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	0 °F	0 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1732 °F < 2200 °F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

ATTACHMENT 3

**NextEra Energy Seabrook, LLC
Seabrook Station**

Table 1: Seabrook Unit 1 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," WCAP-10054-P-A, August 1985 and Addendum 2, Revision 1, July 1997.

Evaluation Model PCT: 1373 °F (Reference 1)

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to 12/31/2022 (Reference 2)	0 °F	0 °F
10 CFR 50.46 Changes or Errors Corrections – year 2023	None	None
Sum of 10 CFR 50.46 Changes or Errors Corrections	0 °F	0 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1373 °F < 2200 °F
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References:

1. Letter from M. Warner to U.S. Nuclear Regulatory Commission, "License Amendment Request 04-03, Application for Stretch Power Uprate," NYN-04016, March 17, 2004.
2. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 2: Seabrook Unit 1 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Code Qualification Document for Best Estimate LOCA Analysis," WCAP-12945-P-A, March 1998.

Evaluation Model PCT: 1784 °F (Reference 1)

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to 12/31/2022 (Reference 2)	155 °F	155 °F
10 CFR 50.46 Changes or Errors Corrections – year 2022	None	None
Error in Flow Area and Volume of Thimble Components (Reference 3)	0 °F	0 °F
Sum of 10 CFR 50.46 Changes or Errors Corrections	155 °F	155 °F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1939 °F < 2200 °F
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References:

1. Letter from M. Warner to U.S. Nuclear Regulatory Commission, "License Amendment Request 04-03, Application for Stretch Power Uprate," NYN-04016, March 17, 2004.
2. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).
3. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 – Emergency Core Cooling System LBLOCA 30-Day Report," L-2024-003, January 11, 2024 (ML24011A130).

ATTACHMENT 4

**NextEra Energy Point Beach, LLC
Point Beach Units 1 and 2**

Table 1: Point Beach Unit 1 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," WCAP-10054-P-A, August 1985 and Addendum 2, Revision 1, July 1997.

Evaluation Model PCT: 1049°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	0°F	0°F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	0°F	0°F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1049°F < 2200°F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 2: Point Beach Unit 1 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)," WCAP-16009-P-A, January 2005.

Westinghouse, "Application of Best Estimate Large Break LOCA Methodology to Westinghouse PWRs with Upper Plenum Injection," WCAP-14449-P-A Revision 1, October 1999.

Evaluation Model PCT: 1975°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	+210°F	210°F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	+210°F	210°F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	2185°F < 2200°F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 3: Point Beach Unit 2 Small Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," WCAP-10054-P-A, August 1985 and Addendum 2, Revision 1, July 1997.

Evaluation Model PCT: 1103°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	0°F	0°F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	0°F	0°F
<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	1103°F < 2200°F	

Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).

Table 4: Point Beach Unit 2 Large Break LOCA PCT 2023 Annual Report

Evaluation Methodology:

Westinghouse, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)," WCAP-16009-P-A, January 2005.

Westinghouse, "Application of Best Estimate Large Break LOCA Methodology to Westinghouse PWRs with Upper Plenum Injection," WCAP-14449-P-A Revision 1, October 1999.

Evaluation Model PCT: 1810°F

	Net PCT Effect	Absolute PCT Effect
Prior 10 CFR 50.46 Changes or Error Corrections – up to Year 2022 (Reference 1)	+248°F	340°F
10 CFR 50.46 Changes or Error Corrections – Year 2023	None	None
Sum of 10 CFR 50.46 Changes or Error Corrections	+248°F	340°F

<i>The sum of the PCT from the most recent analysis using an acceptable evaluation model and the estimates of PCT impact for changes and errors identified since this analysis</i>	2058°F < 2200°F
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Reference:

1. Letter from D. Strand to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Reporting of Changes to, or Errors in Emergency Core Cooling System Models or Applications," L-2023-028, March 27, 2023 (ML23086C017).