



March 18, 2013

L-2013-092
10 CFR 50.46

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

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Acceptance Criteria for Emergency Core Cooling
Systems for Light Water Nuclear Power Reactors
10 CFR 50.46 Annual Report

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 St. Lucie Units 1 and 2 is reported in the attachment to this letter. The estimated effect from any such change or error on the limiting ECCS analysis for each unit is also addressed. The data interval for the report is from January 1, 2012 through December 31, 2012.

Please contact us should you have any questions regarding this submittal.

Sincerely,

A handwritten signature in black ink that reads "Eric S. Katzman".

Eric S. Katzman
Licensing Manager
St. Lucie Plant

ESK/KWF

Attachment

A002
NRK

St. Lucie Units 1 and 2
10 CFR 50.46 Annual Report

Emergency core cooling system (ECCS) analyses for St. Lucie Unit 1 and St. Lucie Unit 2 are performed by AREVA and Westinghouse Electric Company (W), respectively. The following information pertaining to the evaluation models for small break loss of coolant accidents (SBLOCA) and large break loss of coolant accidents (LBLOCA), and the application of such models to each St. Lucie Unit, is provided pursuant to 10 CFR 50.46(a)(3)(ii). A summary of calculated peak cladding temperature (PCT) changes is provided in Tables 1 and 2 (for St. Lucie Units 1 and 2, respectively). The data interval for this report is from January 1, 2012 through December 31, 2012. A discussion of the changes follows.

1.0 ST LUCIE UNIT 1

1.1 Changes to SBLOCA

A new evaluation model analysis was submitted to the Nuclear Regulatory Commission (NRC) as part of the St. Lucie Unit 1 Extended Power Uprate (EPU) submittal and approved by the NRC in 2012 (References 3.1 and 3.4). There was one change/error to the EPU evaluation model PCT.

1) A correction to the Sleicher-Rouse heat transfer correlation used in the S-RELAP5 code resulted in an estimated impact of -27 °F to the PCT.

The limiting SBLOCA PCT with the above estimated impact is 1780 °F and is documented in Table 1.

1.2 Changes to LBLOCA

A new evaluation model analysis was submitted to the NRC as part of the St. Lucie Unit 1 Extended Power Uprate (EPU) submittal and approved by the NRC in 2012 (References 3.1 and 3.4). There were three changes/errors to the EPU evaluation model PCT.

1) A correction to the Sleicher-Rouse heat transfer correlation used in the S-RELAP5 code resulted in an estimated impact of +8 °F to the PCT.

2) Kinetic parameters were determined to be not consistent with the applicable guidelines. The corrected inputs resulted in an estimated impact of -9 °F to the PCT.

3) The equation used for the Cathcart-Pawel correlation uncertainty multiplier was determined to be incorrect. The correction to the equation resulted in an estimated impact of 0 °F to the PCT.

The estimated limiting LBLOCA PCT with the above estimated impacts is 1666 °F and is documented in Table 1.

2.0 ST. LUCIE UNIT 2

2.1 Changes to SBLOCA

A new evaluation model analysis was submitted to the NRC as part of the St. Lucie Unit 2 Extended Power Uprate (EPU) submittal and approved by the NRC in 2012 (Reference 3.2). There were no changes/errors applicable to the EPU evaluation model PCT. The limiting SBLOCA PCT remains at 1903 °F and is documented in Table 2.

2.2 Changes to LBLOCA

A new evaluation model analysis was submitted to the NRC as part of the St. Lucie Unit 2 Extended Power Uprate (EPU) submittal and approved by the NRC in 2012 (Reference 3.2). There were no changes/errors applicable to the EPU evaluation model PCT. The limiting LBLOCA PCT remains at 2087 °F and is documented in Table 2.

3.0 REFERENCES

- 3.1 NRC Letter “St. Lucie Plant, Unit 1 – Issuance of Amendment Regarding Extended Power Uprate (TAC No. ME5091),” July 9, 2012.
- 3.2 NRC Letter “St. Lucie Plant, Unit 2 – Issuance of Amendment Regarding Extended Power Uprate (TAC No. ME5843),” September 24, 2012.
- 3.3 FPL Letter L-2012-103, Eric Katzman to U.S. Nuclear Regulatory Commission Document Control Desk, “St. Lucie Units 1 Docket No. 50-335 Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors 10 CFR 50.46 Change Report,” March 15, 2012.
- 3.4 NRC Letter “St. Lucie Plant, Unit 1 – Correction to Amendment No. 213 Regarding Extended Power Uprate (TAC No. ME5091),” July 12, 2012.

Table 1: 2012 St. Lucie Unit 1 SBLOCA and LBLOCA PCT Summary

Unit 1 SBLOCA Summary

Evaluation Model: EMF-2328(P)(A) Rev. 0 as supplemented by ANP-3000(P), Revision 0

Evaluation Model PCT: 1807°F

			Net PCT Effect	Absolute PCT Effect	PCT
A	Prior 10 CFR 50.46 Changes or Error Corrections – Previous Years		-63 °F	83 °F	1702 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Year 2012		See below	See below	
	New Analysis – EPU submittal approved in Reference 3.1.				1807 °F
C	10 CFR 50.46 Changes in Year 2012 Since Item B		See below	See below	
	Sleicher-Rouse correlation correction		-27 °F	27 °F	1780 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		27 °F	

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

1780 °F < 2200 °F

Unit 1 LBLOCA Summary

Evaluation Model: EMF-2103(P)(A) Rev. 0 as supplemented by ANP-2903(P), Revision 1

Evaluation Model PCT: 1667°F

			Net PCT Effect	Absolute PCT Effect	PCT
A	Prior 10 CFR 50.46 Changes or Error Corrections – Previous Years		+74 °F	76 °F	2079 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Year 2012		See below	See below	
	Increase in maximum analyzed containment spray flow		+1 °F	1 °F*	2080 °F
	New Analysis – EPU submittal approved in Reference 3.1.				1667 °F
C	10 CFR 50.46 Changes in Year 2012 Since Item B		See below	See below	
	Sleicher-Rouse correlation correction		+8 °F	8 °F	1675 °F
	Neutronics input correction		-9 °F	9 °F	1666 °F
	Cathcart-Pawel Correlation Uncertainty Correction		0 °F	0 °F	1666 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		17°F	

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

1666 °F < 2200 °F

* Previously submitted to NRC in 30 day report in Reference 3.3

Table 2: 2012 St. Lucie Unit 2 SBLOCA and LBLOCA PCT Summary

Unit 2 SBLOCA Summary

Evaluation Model: CENPD-137, Supplement 2-P-A (S2M)

Evaluation Model PCT: 1903°F

			Net PCT Effect	Absolute PCT Effect	PCT
A	Prior 10 CFR 50.46 Changes or Error Corrections – Previous Years		0 °F	0 °F	1943 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Year 2012		See below	See below	
	New Analysis – EPU submittal approved in Reference 3.2.				1903 °F
C	10 CFR 50.46 Changes in Year 2012 Since Item B		0 °F	0 °F	1903 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		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>	1903 °F < 2200 °F
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Unit 2 LBLOCA Summary

Evaluation Model: CENPD-132, Supplement 4-P-A (1999 EM)

Evaluation Model PCT: 2087°F

			Net PCT Effect	Absolute PCT Effect	PCT
A	Prior 10 CFR 50.46 Changes or Error Corrections – Previous Years		+6 °F	14 °F	2110 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Year 2012		See below	See below	
	New Analysis – EPU submittal approved in Reference 3.2.				2087 °F
C	10 CFR 50.46 Changes in Year 2012 Since Item B		0 °F	0 °F	2087 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		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>	2087 °F < 2200 °F
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