



March 24, 2015

L-2015-093  
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, 2014 through December 31, 2014.

Please contact Ken Frehafer at 772-467-7748 should you have any questions regarding this submittal.

Sincerely,

A handwritten signature in black ink that reads "ES Katzman". The signature is written in a cursive, somewhat stylized font.

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, 2014 through December 31, 2014. A discussion of the changes follows.

## **1.0 ST LUCIE UNIT 1**

### **1.1 Changes to SBLOCA**

One error was found in the SBLOCA ECCS performance analysis since the previous annual report of Reference 3.1.

The vapor absorptivity correlation was incorrectly applied outside of the bounds of the correlation. When the equations using the correlation were truncated at the appropriate conditions, the estimated impact was 90 °F. This error was previously reported in a 30-day report in Reference 3.2.

The limiting SBLOCA PCT with the above estimated impact is 1870 °F and is documented in Table 1.

### **1.2 Changes to LBLOCA**

There were two errors found in the LBLOCA ECCS performance analysis since the previous annual report of Reference 3.1.

The vapor absorptivity correlation was incorrectly applied outside of the bounds of the correlation. When the equations using the correlation were truncated at the appropriate conditions, the estimated impact was 0 °F.

The modal decomposition (re-mapping of neutronics nodes to S-RELAP5 node structure) resulted in non-physical axial shapes being generated in some cases. For PSL 1 the shapes generated still remained applicable, therefore the estimated impact was 0 °F.

The limiting LBLOCA PCT with the above estimated impact is 1672 °F and is documented in Table 1.

## **2.0 ST. LUCIE UNIT 2**

### **2.1 Changes to SBLOCA**

No errors were found in the SBLOCA ECCS performance analysis since the previous annual report of Reference 3.1. The limiting SBLOCA PCT remains at 1903 °F and is documented in Table 1.

### **2.2 Changes to LBLOCA**

No errors were found in the LBLOCA ECCS performance analysis since the previous annual report of Reference 3.1. The limiting LBLOCA PCT remains at 2087 °F and is documented in Table 1.

### **3.0 REFERENCES**

- 3.1 Letter L-2014-095, Eric Katzman to U.S. Nuclear Regulatory Commission Document Control Desk, “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,” March 31, 2014.
- 3.2 Letter L-2014-134, Eric Katzman to U.S. Nuclear Regulatory Commission Document Control Desk, “St. Lucie Unit 1 Docket No. 50-335 Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors 10 CFR 50.46 Change Report,” May 12, 2014.

**Table 1: 2014 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 (Reference 3.1)		-27 °F	27 °F	1780 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Current Year (Reference 3.2)		See below	See below	
	Vapor absorptivity correlation applied outside the bounds of the correlation		+90 °F	90 °F	1870 °F
C	10 CFR 50.46 Changes in Current Year Since Item B		0 °F	0 °F	1870 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		117 °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	<b>1870 °F &lt; 2200 °F</b>
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**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 (Reference 3.1)		+5 °F	23 °F	1672 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Current Year		+0 °F	0 °F	1672 °F
C	10 CFR 50.46 Changes in Current Year Since Item B		See below	See below	
	Vapor absorptivity correlation applied outside the bounds of the correlation		+0 °F	0 °F	1672 °F
	Modal decomposition generation of non-physical shapes		+0 °F	0 °F	1672 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		23°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	<b>1672 °F &lt; 2200 °F</b>
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**Table 2: 2014 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 (Reference 3.1)		0 °F	0 °F	1903 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Current Year		0 °F	0 °F	1903 °F
C	10 CFR 50.46 Changes in Current Year Since Item B		0 °F	0 °F	1903 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		0 °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	<b>1903 °F &lt; 2200 °F</b>
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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 (Reference 3.1)		0 °F	0 °F	2087 °F
B	Prior 10 CFR 50.46 Changes or Errors Corrections – Current Year		0 °F	0 °F	2087 °F
C	10 CFR 50.46 Changes in Current Year Since Item B		0 °F	0 °F	2087 °F
D	Absolute Sum of 10 CFR 50.46 Changes	ΔPCT		0 °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	<b>2087 °F &lt; 2200 °F</b>
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