



March 31, 2005

L-2005-067
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, 2004 through December 31, 2004.

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

Very truly yours,

A handwritten signature in black ink, appearing to read 'WJ', is written over a horizontal line.

William Jefferson, Jr.
Vice President
St. Lucie Plant

WJ/spt

Attachment

A001

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 Framatome ANP, Inc. (FRA-ANP) 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 Table 1. The data interval for this report is from January 1, 2004 through December 31, 2004.

1.0 ST. LUCIE UNIT 1

- 1.1 No errors were found in the SBLOCA ECCS performance analysis since the previous report of Reference 3.1. The limiting SBLOCA PCT remains at 1766⁰F.
- 1.2 Two errors/issues were identified impacting the LBLOCA PCT. These errors, not previously reported in Reference 3.1, are described below. Table 1 summarizes the estimated impact of these errors/issues on the St. Lucie Unit 1 LBLOCA PCT. The limiting LBLOCA PCT with the estimated effect of the changes is 2047⁰F.

Error in Loss Coefficients Used in RELAP4 and RFPAC/REFLEX Codes

The analysis of record had loss coefficient mismatches between RELAP4 and RFPAC/REFLEX codes. The mismatches are that i) not all of the downcomer, lower plenum and lower head loss coefficients in RELAP4 were included in the downcomer node loss coefficients in the RFPAC/REFLEX input, ii) the intact loops cold leg to vessel inlet loss coefficients were not carried forward into the RFPAC/REFLEX cold leg nodes, and iii) the break loop cold leg to vessel inlet loss coefficients were not carried forward into the RFPAC/REFLEX downcomer to containment node in RFPAC/REFLEX. The PCT impact of this error correction on the St. Lucie Unit 1 LBLOCA analysis is estimated to be +4⁰F.

Error in Containment Heat Structure Mesh Spacing Coordinates

The analysis of record was identified to have error in the mesh spacing coordinates on the right boundaries of the containment heat structures in the RFPAC/ICECON input to the SEM/PWR-98 analysis. The error affected all heat structures that are modeled with multiple regions. Heat structures, with only a single region, are not affected since for a single region the thickness is equal to the right boundary. The PCT impact of correcting this error on the St. Lucie Unit 1 LBLOCA analysis is estimated to be +2⁰F.

2.0 ST. LUCIE UNIT 2

- 2.1 No errors were found in the SBLOCA analysis impacting the PCT previously reported in Reference 3.1. The limiting PCT for SBLOCA at the end of year 2004 is 2132.6⁰F. The SBLOCA was reanalyzed for Cycle 15 for the 30% steam generator tube plugging analysis, submitted to the NRC in Reference 3.2 and approved by the NRC in Reference 3.3. This analysis (PCT of 1943⁰F) remains applicable for the current Cycle 15, which began operation in February 2005.
- 2.2 No errors were found in the LBLOCA analysis impacting the PCT previously reported in Reference 3.1. The limiting PCT for LBLOCA at the end of year 2004 is 2126⁰F.

The LBLOCA was reanalyzed for Cycle 15 for the 30% steam generator tube plugging analysis, submitted to the NRC in Reference 3.2 and approved by the NRC in Reference 3.3. This analysis (PCT of 2130⁰F) remains applicable for the current Cycle 15, which began operation in February 2005.

3.0 REFERENCES

- 3.1 FPL Letter L-2004-066, W. Jefferson, Jr. to USNRC 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 25, 2004
- 3.2 FPL Letter L-2003-276, W. Jefferson Jr. to USNRC Document Control Desk, "St. Lucie Units 2, Docket No. 50-389, Proposed License Amendment WCAP-9272 Reload Methodology and Implementing 30% Steam Generator Tube Plugging," December 2, 2003
- 3.3 Letter B. T. Moroney (USNRC) to J. A. Stall (FPL), "St. Lucie Plant, Unit No. 2 – Issuance of Amendment Regarding Change in Reload Methodology and Increase in Steam Generator Tube Plugging Limit (TAC No. MC1566)," January 31, 2005

Table 1: 2004 St. Lucie Units 1 and 2 SBLOCA and LBLOCA PCT Summary

Unit 1 SBLOCA Summary	PCT
Year 2003 10 CFR 50.46 Annual Report (L-2004-066)	1766 ⁰ F
Change during year 2004	0 ⁰ F
Year 2004 10 CFR 50.46 Annual Report	1766 ⁰ F

Unit 1 LBLOCA Summary	PCT
Year 2003 10 CFR 50.46 Annual Report (L-2004-066)	2041 ⁰ F
Change due to error in loss coefficients used in RELAP4 and FRPAC/REFLEX codes	4 ⁰ F
Change due to error in containment heat structure mesh spacing coordinates	2 ⁰ F
Year 2004 10 CFR 50.46 Annual Report	2047 ⁰ F

Unit 2 SBLOCA Summary	PCT
Year 2003 10 CFR 50.46 Annual Report (L-2004-066)	2132.6 ⁰ F
Change during year 2004	0 ⁰ F
Year 2004 10 CFR 50.46 Annual Report	2132.6 ⁰ F

Unit 2 LBLOCA Summary	PCT
Year 2003 10 CFR 50.46 Annual Report (L-2004-066)	2126 ⁰ F
Change during year 2004	0 ⁰ F
Year 2004 10 CFR 50.46 Annual Report	2126 ⁰ F