ATTACHMENT 8
LICENSE AMENDMENT REQUEST
EXTENDED POWER UPRATE

CORE OPERATING LIMITS REPORT MARKUPS

(For Information Only)

FLORIDA POWER & LIGHT
ST. LUCIE UNIT 2

This coversheet plus 12 pages

LIST OF PAGES

<u>Core Operating Limits Report</u>

5 of 18
6 of 18
8 of 18 (replaced by Proposed COLR Figure 3.1-1a)
Proposed COLR Figure 3.1-1a
12 of 18 (replaced by Proposed COLR Figure 3.2-3)
Proposed COLR Figure 3.2-3
14 of 18
15 of 18
16 of 18
17 of 18
18 of 18

heat rate $LHR^M(z)$. The incremental penalty factors (in excess of 2% margin decrease) are included in the W(z) function of Table 3.2-3.

Incore Detector Monitoring System
During operation, with the linear heat rate being monitored by the Incore Detector Monitoring System, the Local Power Density alarm setpoints shall be adjusted to less than or equal to the limits shown on Figure 3.2-1.

2.5 TOTAL INTEGRATED RADIAL PEAKING FACTOR - F_r^T (TS 3.2.3)

The calculated value of F_r^T shall be limited to ≤ ~~1.70.~~ 1.60

The power dependent F_r^T limits are shown on Figure 3.2-3.

2.6 DNB Parameters (TS 3.2.5)

The following DNB-related parameters shall be maintained within the limits shown on Table 3.2-2:

Total

a. Cold Leg Temperature
b. Pressurizer Pressure
c. Reactor Coolant System Flow rate
d. AXIAL SHAPE INDEX

2.7 Refueling Operations - Boron Concentration (TS 3.9.1)

With the reactor vessel head closure bolts less than fully tensioned or with the head removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

1900

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to ~~1720~~ ppm.

2.8 SHUTDOWN MARGIN – T_{avg} Greater Than 200 °F (TS 3.1.1.1)

The SHUTDOWN MARGIN shall be greater than or equal to 3600 pcm.

2.9 SHUTDOWN MARGIN – T_{avg} Less Than or Equal To 200 °F (TS 3.1.1.2)

The SHUTDOWN MARGIN shall be greater than or equal to 3000 pcm.

Table 3.2-2

DNB MARGIN LIMITS

PARAMETER	FOUR REACTOR COOLANT PUMPS OPERATING
Cold Leg Temperature (narrow Range)	$535^0F^{**} \leq T \leq \cancel{549}^0F$ 551
Pressurizer Pressure*	$2225 \text{ psia} \leq P_{PZR} \leq 2350 \text{ psia}^{**}$
Reactor Coolant Flow Rate System Total	$\geq$ 375,000 gpm
AXIAL SHAPE INDEX	Within the limits specified in Figure 3.2-4

* Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% of RATED THERMAL POWER or a THERMAL POWER step increase of greater than 10% of RATED THERMAL POWER.

** Applicable only if power level ≥ 70% of RATED THERMAL POWER.

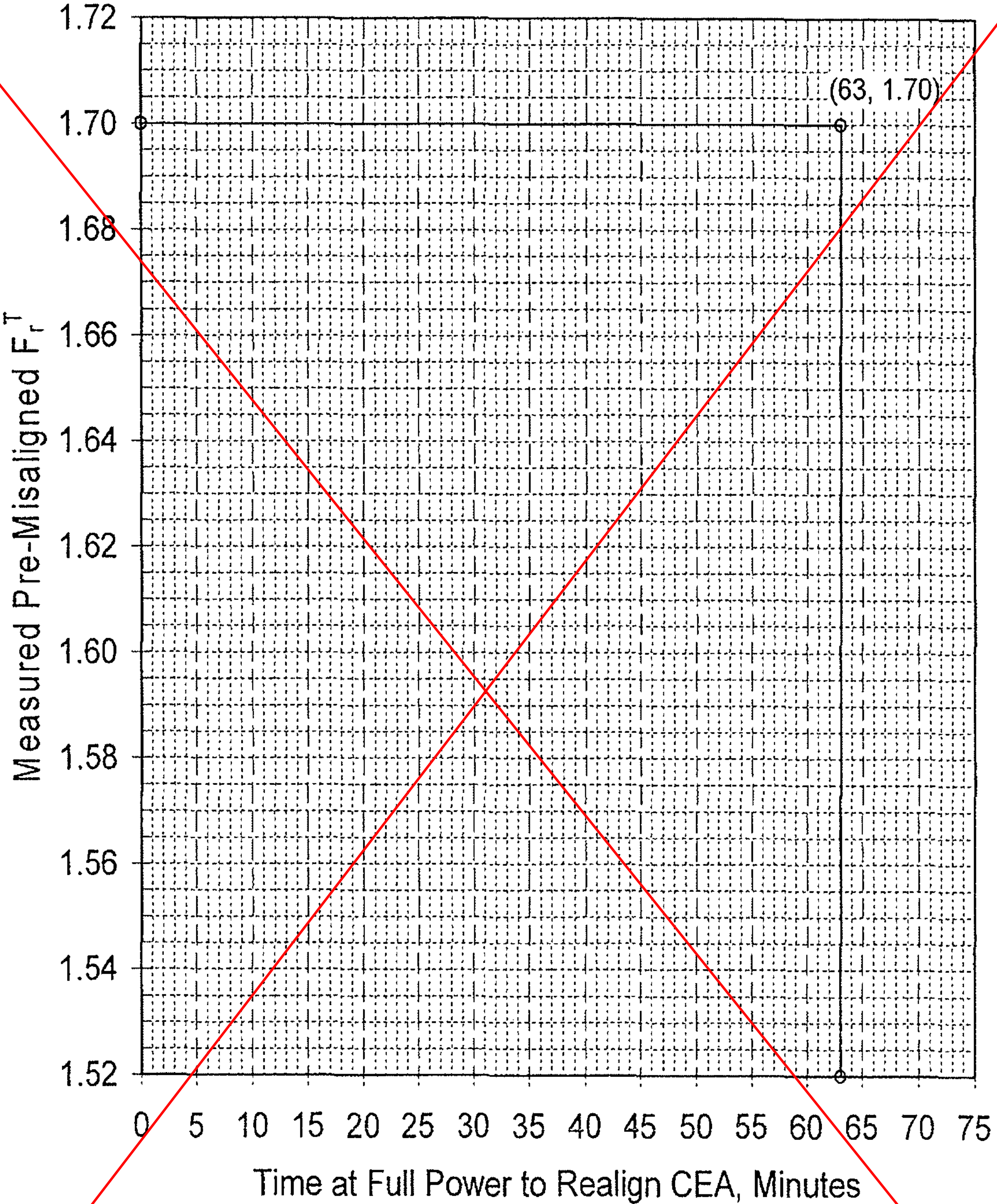

FIGURE 3.1-1a
Allowable Time to Realign CEA vs. Initial F_r^T

Proposed COLR Figure 3.1-1a

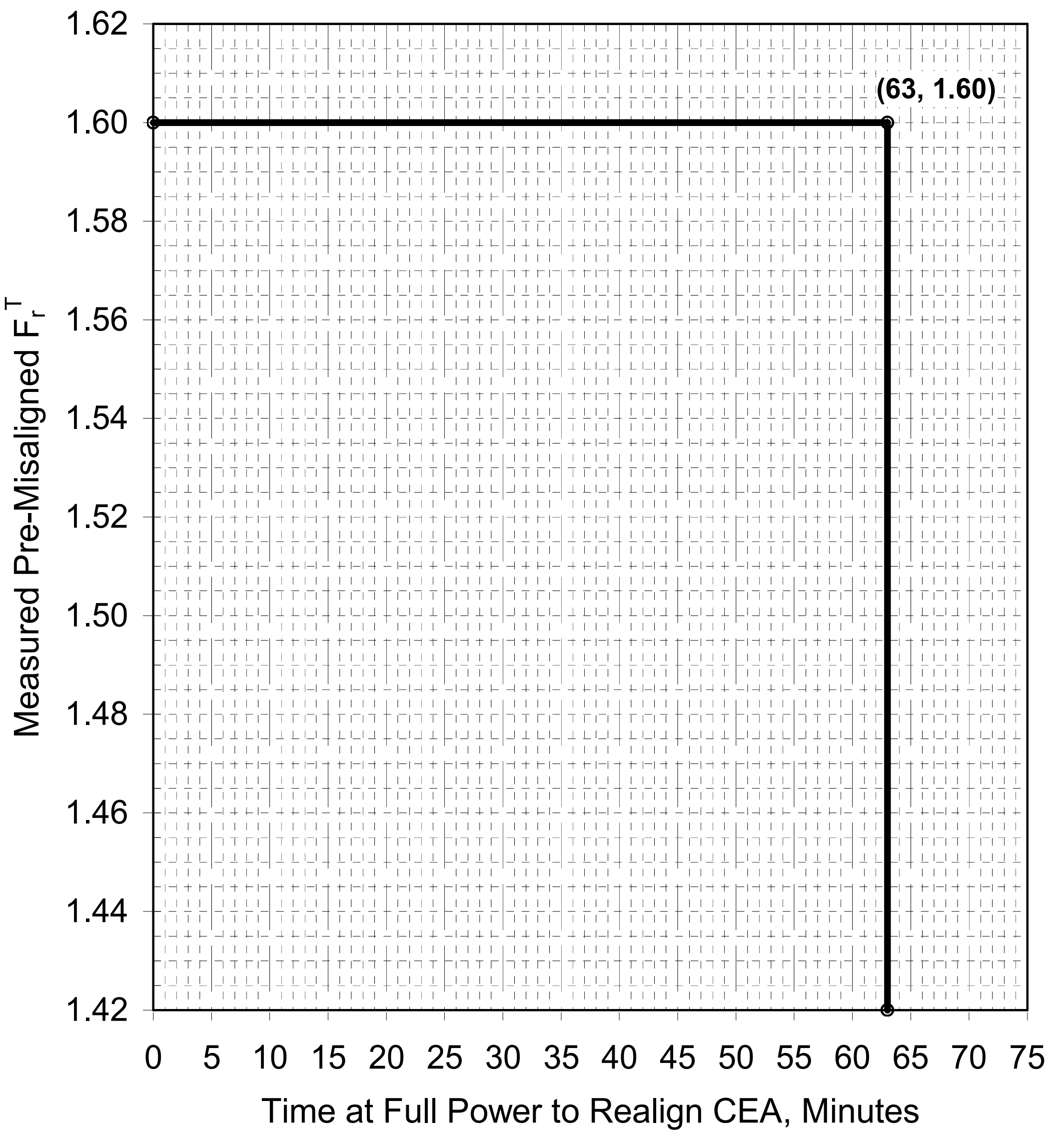

FIGURE 3.1-1a
Allowable Time to Realign CEA vs. Initial F_r^T

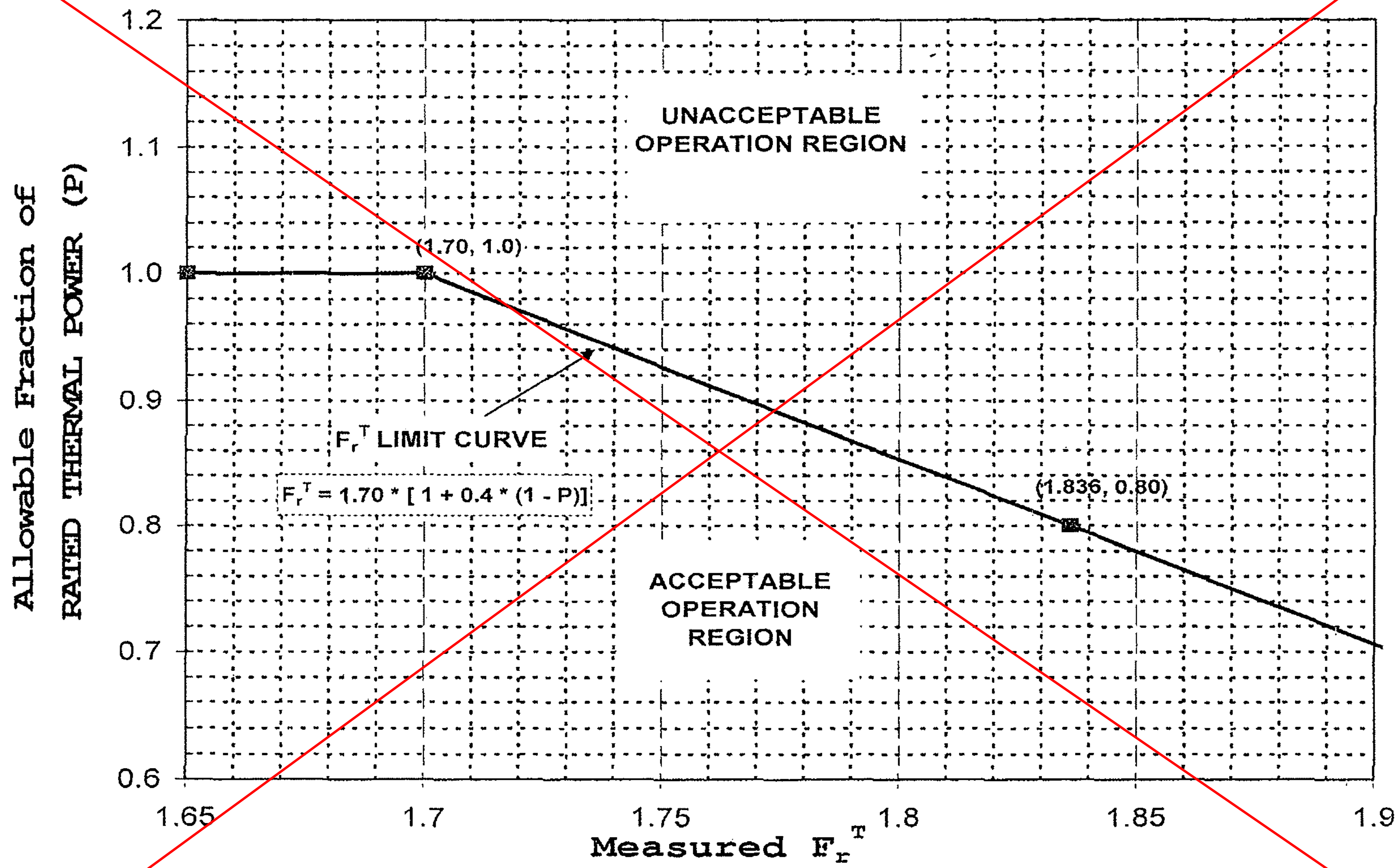

FIGURE 3.2-3

Allowable Combinations of THERMAL POWER and F_r^T

(The expression specified in the Figure may be used for F_r^T at other power levels)

Proposed COLR Figure 3.2-3

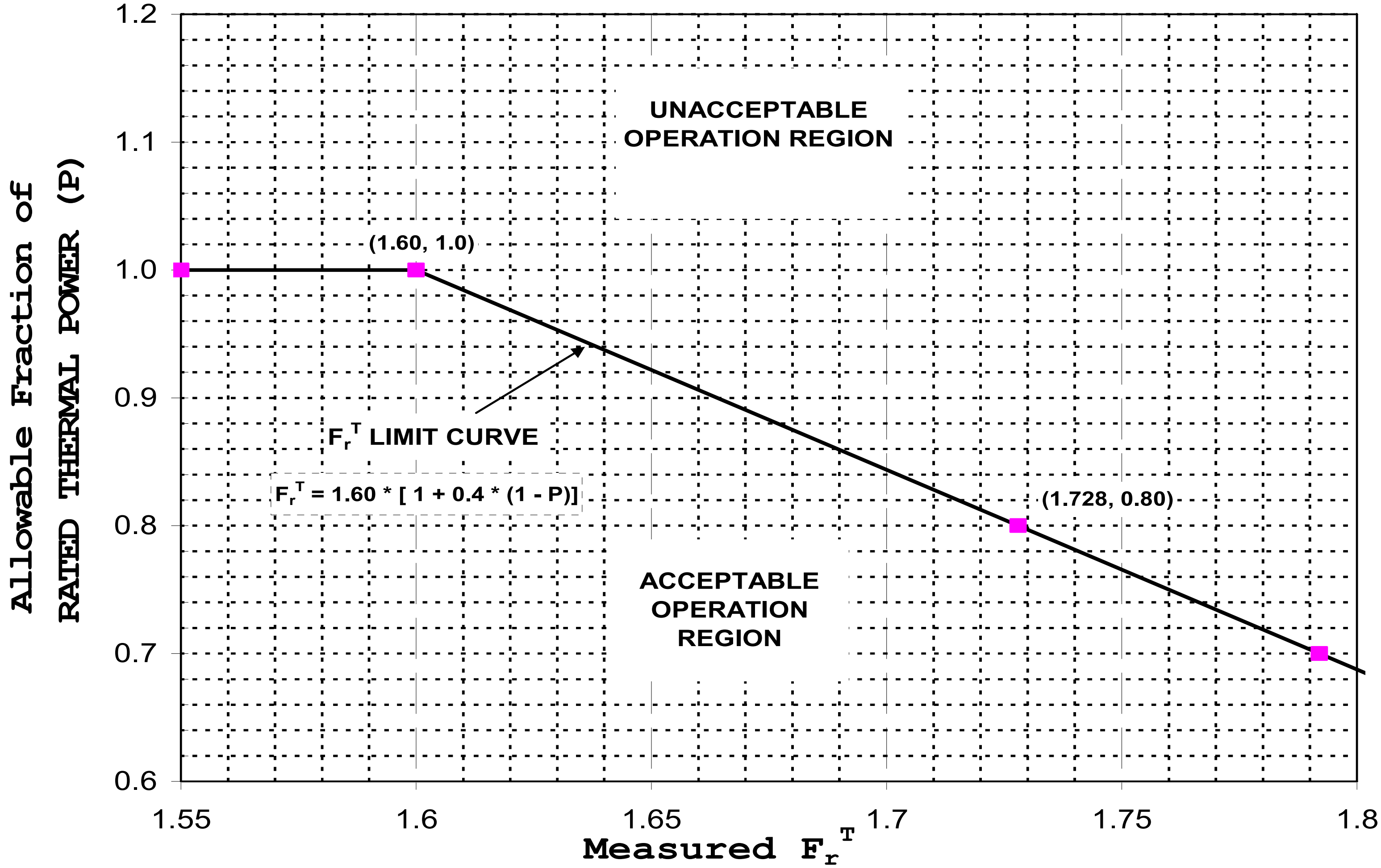

FIGURE 3.2-3

Allowable Combinations of THERMAL POWER and F_r^T

(The expression specified in the Figure may be used for F_r^T at other power levels)

3.0 LIST OF APPROVED METHODS

The analytical methods used to determine the core operating limits are those previously approved by the NRC, and are listed below.

1. WCAP-11596-P-A, "Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," June 1988 (Westinghouse Proprietary)

2. NF-TR-95-01, "Nuclear Physics Methodology for Reload Design of Turkey Point & St. Lucie Nuclear Plants," Florida Power & Light Company, January 1995 (NRC SER dated June 9, 1995), & Supplement 1, August 1997

3. ~~CENPD-199-P, Rev. 1-P-A, "C-E Setpoint Methodology: CE Local Power Density and DNB LSSS and LCO Setpoint Methodology for Analog Protection Systems," January 1986~~

4. ~~CENPD-266-P-A, "The ROCS and DIT Computer Code for Nuclear Design," April 1983~~

5. CENPD-275-P, Revision 1-P-A, "C-E Methodology for Core Designs Containing Gadolinia-Urania Burnable Absorbers," May 1988, & Revision 1-P Supplement 1-P-A, April 1999

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6. ~~CENPD-188-A, "HERMITE: A Multi-Dimensional Space - Time Kinetics Code for PWR Transients," July 1976~~

7. ~~CENPD-153-P, Rev. 1-P-A, "Evaluation of Uncertainty in the Nuclear Power Peaking Measured by the Self-Powered, Fixed Incore Detector System," May 1980~~

8. CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 1: C-E Calculated Local Power Density and Thermal Margin/Low Pressure LSSS for St. Lucie Unit 1," December 1979

9. ~~CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 2: Combination of System Parameter Uncertainties in Thermal Margin Analyses for St. Lucie Unit 1," January 1980~~

10. CEN-123(F)-P, "Statistical Combination of Uncertainties Methodology Part 3: C-E Calculated Departure from Nucleate Boiling and Linear Heat Rate Limiting Conditions for Operation for St. Lucie Unit 1," February 1980

11. CEN-191(B)-P, "CETOP-D Code Structure and Modeling Methods for Calvert Cliffs Units 1 and 2," December 1981

12. Letter, J. W. Miller (NRC) to J. R. Williams, Jr. (FPL), Docket No. 50-389, Regarding Unit 2 Cycle 2 License Approval (Amendment No. 8 to NPF-16 and SER), November 9, 1984 (Approval of CEN-123(F)-P (three parts) and CEN-191(B)-P)

13. ~~CEN-371(F)-P, "Extended Statistical Combination of Uncertainties," July 1989~~

14. Letter, J. A. Norris (NRC) to J. H. Goldberg (FPL), Docket No. 50-389, "St. Lucie Unit 2 - Change to Technical Specification Bases Sections '2.1.1 Reactor Core' and '3/4.2.5 DNB Parameters' (TAC No. M87722)," March 14, 1994 (Approval of CEN-371(F)-P)

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15. ~~CENPD-161-P-A, "TORC Code, A Computer Code for Determining the Thermal Margin of a Reactor Core," April 1986~~

16. ~~CENPD-162-P-A, "Critical Heat Flux Correlation for C-E Fuel Assemblies with Standard Spacer Grids Part 1, Uniform Axial Power Distribution," April 1975~~

17. ~~CENPD-207-P-A, "Critical Heat Flux Correlation for C-E Fuel Assemblies with Standard Spacer Grids Part 2, Non-uniform Axial Power Distribution," December 1984~~

18. ~~CENPD-206-P-A, "TORC Code, Verification and Simplified Modeling Methods," June 1981~~

19. CENPD-225-P-A, "Fuel and Poison Rod Bowing," June 1983

20. CENPD-139-P-A, "C-E Fuel Evaluation Model Topical Report," July 1974

21. CEN-161(B)-P-A, "Improvements to Fuel Evaluation Model," August 1989

22. CEN-161(B)-P, Supplement 1-P-A, "Improvements to Fuel Evaluation Model," January 1992

23. CENPD-132, Supplement 3-P-A, "Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and W Designed NSSS," June 1985

24. CENPD-133, Supplement 5-A, "CEFLASH-4A, A FORTRAN77 Digital Computer Program for Reactor Blowdown Analysis," June 1985

25. CENPD-134, Supplement 2-A, "COMPERC-II, a Program for Emergency Refill-Reflood of the Core," June 1985

26. CENPD-135-P, Supplement 5, "STRIKIN-II, A Cylindrical Geometry Fuel Rod Heat Transfer Program," April 1977

27. Letter, R. L. Baer (NRC) to A. E. Scherer (CE), "Evaluation of Topical Report CENPD-135, Supplement #5," September 6, 1978

28. CENPD-137, Supplement 1-P, "Calculative Methods for the C-E Small Break LOCA Evaluation Model," January 1977

29. CENPD-133, Supplement 3-P, "CEFLASH-4AS, A Computer Program for the Reactor Blowdown Analysis of the Small Break Loss of Coolant Accident," January 1977

30. Letter, K. Kniel (NRC) to A. E. Scherer (CE), "Evaluation of Topical Reports CENPD-133, Supplement 3-P and CENPD-137, Supplement 1-P," September 27, 1977

31. CENPD-138, Supplement 2-P, "PARCH, A FORTRAN-IV Digital Program to Evaluate Pool Boiling, Axial Rod and Coolant Heatup," January 1977

32. Letter, C. Aniel (NRC) to A. E. Scherer (CE), "Evaluation of Topical Report CENPD-138, Supplement 2-P," April 10, 1978

33. Letter, W. H. Bohlke (FPL) to Document Control Desk (NRC), "St. Lucie Unit 2, Docket No. 50-389, Proposed License Amendment, MTC Change from -27 pcm to -30 pcm," L-91-325, December 17, 1991

34. Letter, J. A. Norris (NRC) to J. H. Goldberg (FPL), "St. Lucie Unit 2 - Issuance of Amendment Re: Moderator Temperature Coefficient (TAC No. M82517)," July 15, 1992

35. Letter, J. W. Williams, Jr. (FPL) to D. G. Eisenhut (NRC), "St. Lucie Unit No. 2, Docket No. 50-389, Proposed License Amendment, Cycle 2 Reload," L-84-148, June 4, 1984

36. Letter, J. R. Miller (NRC) to J. W. Williams, Jr. (FPL), Docket No. 50-389, Regarding Unit 2 Cycle 2 License Approval (Amendment No. 8 to NPF-16 and SER), November 9, 1984 (Approval of Methodology contained in L-84-148)

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37. ~~Letter, A. E. Scherer Enclosure 1-P to LD-82-001, "CESEC-Digital Simulation of a Combustion Engineering Nuclear Steam Supply System," December 1981~~

38. ~~Safety Evaluation Report, "CESEC Digital Simulation of a Combustion Engineering Steam Supply System (TAC No.: 01142)," October 27, 1983~~

39. ~~CENPD-282-P-A, Volumes 1, 2, and 3, and Supplement 1, "Technical Manual for the CENTS Code," February 1991, February 1991, October 1991, and June 1993, respectively~~

40. ~~CEN-121(B)-P, "CEAW, Method of Analyzing Sequential Control Element Assembly Group Withdrawal Event for Analog Protected Systems," November 1979 (NRC SER dated December 21, 1999, Letter K. N. Jabbour (NRC) to T. F. Plunkett (FPL), TAC No. MA4523)~~

41. ~~CEN-133(B), "FIESTA, A One Dimensional, Two Group Space-Time Kinetics Code for Calculating PWR Scram Reactivities," November 1979 (NRC SER dated December 21, 1999, Letter K. N. Jabbour (NRC) to T. F. Plunkett (FPL), TAC No. MA4523)~~

42. CEN-348(B)-P-A, Supplement 1-P-A, "Extended Statistical Combination of Uncertainties," January 1997

43. CEN-372-P-A, "Fuel Rod Maximum Allowable Gas Pressure," May 1990

44. ~~CENPD-183-A, "C-E Methods for Loss of Flow Analysis," June 1984~~

45. ~~CENPD-190-A, "C-E Method for Control Element Assembly Ejection Analysis," July 1976~~

46. ~~CENPD-199-P, Rev. 1-P-A, Supplement 2-P-A, "CE Setpoint Methodology", June 1998~~

47. ~~CENPD-382-P-A, "Methodology for Core Designs Containing Erbium Burnable Absorbers," August 1993~~

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48. CEN-396(L)-P, "Verification of the Acceptability of a 1-Pin Burnup Limit of 60 MWD/KG for St. Lucie Unit 2," November 1989 (NRC SER dated October 18, 1991, Letter J. A. Norris (NRC) to J. H. Goldberg (FPL), TAC No. 75947)

49. CENPD-269-P, Rev. 1-P, "Extended Burnup Operation of Combustion Engineering PWR Fuel," July 1984

50. CEN-289(A)-P, "Revised Rod Bow Penalties for Arkansas Nuclear One Unit 2," December 1984 (NRC SER dated December 21, 1999, Letter K. N. Jabbour (NRC) to T. F. Plunkett (FPL), TAC No. MA4523)

51. CENPD-137, Supplement 2-P-A, "Calculative Methods for the ABB CE Small Break LOCA Evaluation Model," April 1998

52. CENPD-140-A, "Description of the CONTRANS Digital Computer Code for Containment Pressure and Temperature Transient Analysis," June 1976

53. ~~CEN-365(L), "Boric Acid Concentration Reduction Effort, Technical Bases and Operational Analysis," June 1988 (NRC SER dated March 13, 1989, Letter J. A. Norris (NRC) to W. F. Conway (FPL), TAC No. 69325)~~

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54. ~~DP-456, F. M. Stern (CE) to E. Case (NRC), dated August 19, 1974, Appendix 6B to CESSAR System 80 PSAR (NRC SER, NUREG-75/112, Docket No. STN 50-470, "NRC SER – Standard Reference System, CESSAR System 80," December 1975)~~

55. CENPD-387-P-A, Revision 000, "ABB Critical Heat Flux Correlations for PWR Fuel," May 2000

56. CENPD-132, Supplement 4-P-A, "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model," March 2001

57. CENPD-137, Supplement 2-P-A, "Calculative Methods for the ABB CE Small Break LOCA Evaluation Model," April 1998

58. CENPD-404-P-A, Rev. 0, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs," November 2001

59. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology'" July 1985

60. WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control; FQ Surveillance Technical Specification," February 1994

61. WCAP-11397-P-A, (Proprietary), "Revised Thermal Design Procedure," April 1989

62. WCAP-14565-P-A, (Proprietary), "VIPRE-01 Modeling and Qualification for Pressurized Water Reactor Non-LOCA Thermal-Hydraulic Safety Analysis," October 1999

63. WCAP-14565-P-A, Addendum 1-A, Revision 0, "Addendum 1 to WCAP-14565-P-A Qualification of ABB Critical Heat Flux Correlations with VIPRE-01 Code," August 2004

64. Letter, W. Jefferson, Jr. (FPL) to Document Control Desk (USNRC), "St. Lucie Unit 2 Docket No. 50-389: Proposed License Amendment WCAP-9272 Reload Methodology and Implementing 30% Steam Generator Tube Plugging Limit," L-2003-276, December, 2003 (NRC SER dated January 31, 2005, Letter B. T. Moroney (NRC) to J. A. Stall (FPL), TAC No. MC1566)

65. WCAP-14882-P-A, "RETRAN-02 Modeling and Qualification for Westinghouse Pressurized Water Reactor Non-LOCA Safety Analyses," April 1999.

66. WCAP-7908-A, "FACTRAN-A FORTRAN IV Code for Thermal Transients in a UO2 Fuel Rod," December, 1989.

67. WCAP-7979-P-A, "TWINKLE - A Multi-Dimensional Neutron Kinetics Computer Code," January 1975.

68. WCAP-7588, Rev 1-A, "An Evaluation of the Rod Ejection Accident in Westinghouse Pressurized Water Reactors Using Special Kinetics Methods," January 1975.