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SUBJECT: "Annual Rept of ECCS Evaluation Model Changes," covering June 1991 to May 1992.Marginal utilization tables,indicating effects of permanent assessment of peak clad temp margin of large & small break LOCA encl.

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Carolina Power & Light Company

JUL 23 1992

SERIAL: NLS-92-199
10 CFR 50.46

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
EMERGENCY CORE COOLING SYSTEM EVALUATION MODEL CHANGES

Gentlemen:

The purpose of this letter is to provide the annual report pursuant to 10 CFR 50.46(a)(3)(ii) for the Shearon Harris Nuclear Power Plant (SHNPP) regarding the estimated effect of changes or errors in Emergency Core Cooling System (ECCS) evaluation models or in the application of the models. This report covers the period of June 1991 through May 1992. There have been no changes to the Westinghouse ECCS Evaluation Model during this reporting period. However, there are supplements to the analyses of record which were implemented during the previous reporting period, June 1990 through May 1991, which continue to be applicable. These supplements resulted in permanent assessment of Peak Clad Temperature (PCT) margin as reported to the NRC by Carolina Power & Light Company (CP&L) on July 26, 1991.

The enclosures to this letter provide the Margin Utilization Tables which show the effects of permanent assessment of PCT margin for various issues for the Large and Small Break Loss of Coolant Accident (LOCA) analyses of record. The information provided is identical to that provided in the July 26, 1991 letter, with one exception. Subsequent investigation has resulted in an adjustment to the value of peak clad temperature for Small Break LOCA (SBLOCA) due to a revision to the Rod Internal Pressure Assumption from 10°F to 33.3°F. As a point of clarification, the July 26, 1991 report showed 30°F for the SBLOCA Rod Internal Pressure Assumption. This item consisted of two components, SBLOCA Cladding Creep Model (20°F) and SBLOCA Rod Internal Pressure Assumption (10°F). In this annual report, these items are listed separately as Items D.3 and D.4, and only the Rod Internal Pressure value has changed.

The Margin Utilization Tables also include a listing of current open issues which are being investigated, but for which no conclusions have yet been reached. Should the resolution of these issues impact the 10 CFR 50.46 ECCS evaluation, then CP&L will report them in the next annual report. Likewise, if any of the issues result in significant change in the calculated PCT, as defined by 10 CFR 50.46, they will be reported to the NRC in accordance with the 30-day reporting requirement.

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

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As stated in a February 19, 1992 letter, CP&L plans to reanalyze both the large and small break LOCA events prior to Cycle 6 for SHNPP, to coincide with a change in nuclear fuel vendors. Accordingly, these analyses of record will be approved and in place to support Refueling Outage No. 5, currently scheduled to begin in March 1994.

Questions regarding this matter may be referred to Mr. R. W. Prunty at (919) 546-7318.

Yours very truly,

D. C. McCarthy
Manager
Nuclear Licensing Section

SDC/sdc

Enclosures:

cc: Mr. S. D. Ebneter
Mr. N. B. Le
Mr. J. E. Tedrow

REPORTING OF 10CFR50.46 MARGIN UTILIZATION LARGE-BREAK LOCA

Plant Name: Shearon Harris Unit 1 (CQL)
Utility Name: Carolina Power & Light Company

A. Analysis of Record — PCT = 2105.2°F
Vantage 5 Reload Transition Safety Report, February 1989
Evaluation Model: 1981 With BASH, FQT = 2.45, FΔH = 1.65
SGTP = 6%, Other: Vantage 5
Fuel Margins Used: Transition Core Penalty — ΔPCT = + 50°F

B. Prior LOCA Model Assessments - 1989 — ΔPCT = + 0°F
(Permanent Assessment of PCT Margin - Letter #: N/A)

C. Prior LOCA Model Assessments - 1990 — ΔPCT = + 0°F
(Permanent Assessment of PCT Margin - Letter #: CQL-91-011)

D. Prior LOCA Model Assessments - 1991
(Permanent Assessment of PCT Margin - Letter #: CQL-91-035)

1. Fuel Rod Initial Condition Inconsistency — ΔPCT = + 10°F
2. LBLOCA Burst and Blockage Assumption — ΔPCT = + 0°F
3. Steam Generator Tube Seismic/LOCA Assumption[1] — ΔPCT = + 0°F

E. 10CFR50.59 Safety Evaluations - (Permanent Assessment of PCT Margin)

Issue: SI Delay Time Increase — ΔPCT = + 4°F
Letter: CQL-90-573 and 90CP*-G-0080

F. Current Permanent PCT — PCT = 2169.2°F

G. Current LOCA Model Issues (No PCT Assessments Made; Still Under Investigation)

1. IFBA Fuel (see reference 3)
2. Containment Initial Temperature (see reference 1)
3. WREFLOOD Discrepancies (see reference 7)
4. Steam Generator Tube Collapse Under Combined LOCA/Seismic Loads (partial through-wall cracking) (see reference 8)
5. LOCTA Coding Errors (see reference 3)
6. IMP Data Base Errors (see reference 5)
7. Hot Leg Recirculation Switchover (see reference 6)
8. Core Average Zirc-Water Reaction (see reference 4)
9. Beginning of Life Rod Internal Pressure Uncertainties (see reference 2)

[1] 1.8 percent steam generator tube plugging margin was assessed to account for possible steam generator tube collapse in the event of a seismic event coincident with a LOCA. Note that this issue accounted for only full through-wall cracking.

REPORTING OF 10CFR50.46 MARGIN UTILIZATION
SMALL-BREAK LOCA

Plant Name: Shearon Harris Unit 1 (CQL)
Utility Name: Carolina Power & Light Company

A.	Analysis of Record Vantage 5 Reload Transition Safety Report, February 1989 Evaluation Model: NOTRUMP, FQT = 2.50, FΔH = 1.65 SGTP = 6%, Other: Vantage 5	PCT = 1779.8°F
B.	Prior LOCA Model Assessments - 1989 (Permanent Assessment of PCT Margin - Letter #: N/A)	ΔPCT = + 0°F
C.	Prior LOCA Model Assessments - 1990 (Permanent Assessment of PCT Margin - Letter #: CQL-91-011)	ΔPCT = + 0°F
D.	Prior LOCA Model Assessments - 1991 (Permanent Assessment of PCT Margin - Letter #: CQL-91-035)	
	1. Fuel Rod Initial Condition Inconsistency	ΔPCT = + 37°F
	2. NOTRUMP Solution Convergence Reliability	ΔPCT = + 0°F
	3. SBLOCA Cladding Creep Model	ΔPCT = + 20°F
	4. SBLOCA Rod Internal Pressure Assumption[1]	ΔPCT = + 33.3°F
E.	10CFR50.59 Safety Evaluations - (Permanent Assessment of PCT Margin)	
	1. Issue: AFW Enthalpy Delay Time Increase Letter: CQL-90-535	ΔPCT = + 36°F
	2. Issue: ECCS Flow Shortfall Evaluation Letter: 90CP*-G-0080 and CQL-90-573	ΔPCT = + 75°F
F.	Current Permanent PCT	PCT = 1981.1°F

G. Current LOCA Model Issues (No PCT Assessments Made; Still Under Investigation)

1. Beginning of Life Rod Internal Pressure Uncertainty Impact on Safety Analysis (see reference 2)
2. IFBA Fuel (see reference 3)
3. LOCTA Coding Methodology Issues (see reference 3)
4. Main Feedwater Isolation (see reference 4)
5. IMP Data Base Errors (see reference 5)
6. Hot Leg Recirculation Switchover (see reference 6)
7. Core Average Zirc-Water Reaction (see reference 4)
8. SBLOCA Burst and Blockage (see reference 4)

[1] This penalty was increased to account for the low backfill pressure IFBA fuel.

REFERENCES

1. ET-NRC-92-3699, "Results of Technical Evaluation of Containment Initial Temperature Assumptions for Large-Break Loss-of-Coolant Accident," June 1, 1992 from N. J. Liparulo (W) to NRC.

2. ET-NRC-92-3695, "Interim Report of a Deviation or Failure to Comply Pursuant to 10CFR21.21(a)(2)," April 30, 1992 from N. J. Liparulo (W) to NRC.

3. ET-NRC-92-3718, "Interim Report of a Deviation or Failure to Comply Pursuant to 10CFR21.21(a)(2)," July 1, 1992 from N. J. Liparulo (W) to NRC.

4. ET-NRC-91-3647, "Interim Report of a Deviation or Failure to Comply Pursuant to 10CFR21.21(a)(2)," December 20, 1991 from S. R. Tritch (W) to NRC.

5. ET-NRC-92-3655, "Interim Report of a Deviation or Failure to Comply Pursuant to 10CFR21.21(a)(2)," January 21, 1992 from S. R. Tritch (W) to NRC.

6. ET-NRC-92-3712, "Interim Report of a Deviation or Failure to Comply Pursuant to 10CFR21.21(a)(2)," June 23, 1992 from N. J. Liparulo (W) to NRC.

7. 92CP*-G-0078, "Shearon Harris Unit 1 - Cycle 5 Preliminary Expanded Text Reload Safety Evaluation (RSE) Report," June 25, 1992 from Beth Pearson McAtee (W) to Thomas Dresser, CP&L.

8. CQL-92-025, "Shearon Harris Unit 1 - Steam Generator Tube Deformation and Potential Secondary to Primary Leakage," June 3, 1992 from G. J. Murray (W) to J. F. Nevill, CP&L.