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July 10, 2001

10 CFR 50.4
10 CFR 50.46(a)(3)

PSLTR: #01-0074

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

Dresden Nuclear Power Station, Units 2 and 3
Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Subject: Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Annual Report

This letter fulfills the annual reporting requirement of 10CFR50.46 "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," paragraph (a)(3) for Dresden Nuclear Power Station (DNPS) Units 2 and 3. The peak cladding temperature (PCT) data reported in this letter are based on estimates by Siemens Power Corporation. Since the sum of the absolute values of the estimated PCT changes does not exceed 50 degrees, reanalysis by an acceptable evaluation model is not required at this time in accordance with NRC Information Notice 97-15, Supplement 1, "Reporting of Errors and Changes in Large-Break/Small-Break Loss-of-Coolant Evaluation Models of Fuel Vendors and Compliance with 10CFR 50.46(a)(3)."

Attachments 1 and 2 provide PCT information for the limiting loss of coolant accident evaluations for DNPS Units 2 and 3, respectively, including all assessments as of July 10, 2001. The assessment notes in Attachment 3 provide a detailed description for each change or error reported.

If there are any questions or comments concerning this letter, please contact Mr. D. F. Ambler at (815) 416-2800.

Respectfully,

Preston Swafford
Site Vice President
Dresden Nuclear Power Station

Attachment 1: Dresden Nuclear Power Station, Unit 2 10 CFR 50.46 Report
Attachment 2: Dresden Nuclear Power Station, Unit 3 10 CFR 50.46 Report
Attachment 3: Dresden Nuclear Power Station, Units 2 and 3 10 CFR 50.46 Report Assessment Notes

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station

A001

Attachment 1
Dresden Nuclear Power Station Unit 2
10CFR50.46 Report

PLANT NAME:	Dresden Nuclear Power Station, Unit 2
ECCS EVALUATION MODEL:	EXEM BWR
REPORT REVISION DATE:	7/10/2001
CURRENT OPERATING CYCLE:	17

ANALYSIS OF RECORD

Evaluation Model: Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model, ANF-91-048(P)(A), dated January 1993.

Calculations:

1. "Dresden LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B and 9x9-2 Fuel – Reduced LPCS Runout Flow," EMF-98-007(P), Supplement 2, Siemens Power Corporation, dated January 1998 (See Note 1)
2. "LOCA Break Spectrum Analysis for Dresden Units 2 and 3," EMF-97-025(P), Revision 1, Siemens Power Corporation, dated May 1997

Fuel: 9x9-2, ATRIUM-9B LFA and ATRIUM-9B
Limiting Fuel Type: 9x9-2
Limiting Single Failure: LPCI Injection Valve
Limiting Break Size and Location: 1.0 Double-Ended Guillotine in a Recirculation Suction Pipe

Reference Peak Cladding Temperature (PCT) (See Note 2) PCT = 2018°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated July 10, 1997 (See Note 3)	ΔPCT = 0°F
10 CFR 50.46 report dated July 10, 1998 (See Note 4)	ΔPCT = 3°F
10 CFR 50.46 report dated July 10, 1999 (See Note 5)	ΔPCT = 20°F
10 CFR 50.46 report dated July 10, 2000 (See Note 6)	ΔPCT = 0°F
Net PCT	**2041 °F**

B. CURRENT LOCA MODEL ASSESSMENTS

Incorrect implementation of strain correlations in the HUXY code (See Note 8)	ΔPCT = 1 °F
Incorrect implementation of Wilson Bubble Rise Model in the FLEX code (See Note 9)	ΔPCT = 1 °F
Incorrect implementation of momentum equation in the FLEX code (See Note 10)	ΔPCT = 0 °F
Impact of FLEX code changes due to validation and verification activities (See Note 11)	ΔPCT = 8 °F
Total PCT change from current assessments	ΣΔPCT = 10 °F
Cumulative PCT change from current assessments	Σ |ΔPCT| = 10°F
Net PCT	**2051 °F**

Attachment 2
Dresden Nuclear Power Station Unit 3
10CFR50.46 Report

PLANT NAME: Dresden Unit 3
ECCS EVALUATION MODEL: EXEM BWR
REPORT REVISION DATE: 7/10/2001
CURRENT OPERATING CYCLE: 17

ANALYSIS OF RECORD

Evaluation Model: Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model, ANF-91-048(P)(A), dated January, 1993.

Calculations:

1. "Dresden LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B and 9x9-2 Fuel," EMF-98-007(P), Siemens Power Corporation, dated January 1998 (See Note 1).

2. "LOCA Break Spectrum Analysis for Dresden Units 2 and 3," EMF-97-025(P), Revision 1, Siemens Power Corporation, dated May 1997.

Fuel: 9x9-2 and ATRIUM-9B
Limiting Fuel Type: 9x9-2
Limiting Single Failure: LPCI Injection Valve
Limiting Break Size and Location: 1.0 Double-Ended Guillotine (DEG) in a Recirculation Suction Pipe

Reference PCT (See Note 2) PCT = 1920°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated July 10, 1997 (See Note 3)	ΔPCT = 0°F
10 CFR 50.46 report dated July 10, 1998 (See Note 4)	ΔPCT = 16°F
10 CFR 50.46 report dated July 10, 1999 (See Note 5)	ΔPCT = 20°F
10 CFR 50.46 report dated July 10, 2000 (See Note 6)	ΔPCT = 0°F
Net PCT	**1956 °F**

B. CURRENT LOCA MODEL ASSESSMENTS

Cycle 17 Reload Fuel (See Note 7)	ΔPCT = 0°F
Incorrect implementation of strain correlations in the HUXY code (See Note 8)	ΔPCT = 1 °F
Incorrect implementation of Wilson Bubble Rise Model in the FLEX code (See Note 9)	ΔPCT = 1 °F
Incorrect implementation of momentum equation in the FLEX code (See Note 10)	ΔPCT = 0 °F
Impact of FLEX code changes due to validation and verification activities (See Note 11)	ΔPCT = 8 °F
Total PCT change from current assessments	∑ΔPCT = 10 °F
Cumulative PCT change from current assessments	∑ |ΔPCT| = 10°F
Net PCT	**1966 °F**

Attachment 3
Dresden Nuclear Power Station Units 2 and 3
10 CFR 50.46 Report Assessment Notes

1. Analysis of Record

   The 50.46 report dated July 10, 1997, noted that the analyses of record were EMF-97-031(P), Revision 1 and EMF-97-031(P) respectively for Units 2 and 3. These reports were reissued in January, 1998, as EMF-98-007(P), Supplement 2 and EMF-98-007(P) respectively.

2. Reporting of Different Peak Cladding Temperatures for Each Unit

   Dresden Unit 2 and Unit 3 are being maintained under separate analyses of record (EMF-98-007(P), Supplement 2 and EMF-98-007(P) respectively) as a result of a degraded Core Spray runout flow condition that exists at Dresden Unit 2. This flow condition is lower with respect to the LOCA analysis assumption for Dresden Unit 3.

   [References: "Dresden LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B and 9x9-2 Fuel – Reduced LPCS Runout Flow," EMF-98-007(P), Supplement 2, Siemens Power Corporation, dated January, 1998.

   "Dresden LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM-9B and 9x9-2 Fuel," EMF-98-007(P), Siemens Power Corporation, dated January, 1998.]

3. Prior LOCA Model Assessment

   The 1997 LOCA model assessment was a new baseline analysis for Dresden Units 2 and 3. Therefore, there is no PCT change.

   [Reference: Letter from J. S. Perry (JSPLTR #97-0131) (ComEd) to USNRC, "Dresden Nuclear Power Station Units 2 and 3, Plant Specific ECCS Evaluation Changes - 10CFR50.46 Report DPR-19 and DPR-25, NRC Docket Nos. 50-237 and 50-249," dated July 10, 1997.]

4. Prior LOCA Model Assessment

   The 50.46 report dated July 10, 1998, assessed the impact of plant parameter changes and errors in the LOCA evaluation model. Calculations were performed to determine the PCT changes for both units.

   [Reference: Letter from J.M. Heffley (JMHLTR #98-0199) (ComEd) to USNRC "Dresden Nuclear Power Station Units 2 and 3, Plant Specific ECCS Evaluation Changes - 10CFR50.46 Annual Report DPR-19 and DPR-25, NRC Docket Nos. 50-237 and 50-249," dated July 10, 1998.]

5. Prior LOCA Model Assessment

   The 50.46 report dated July 10, 1999, assessed the impact of errors in the LOCA evaluation model. The PCT reported was based on estimates by Siemens Power Corporation. SPC also calculated the PCT for the new ATRIUM fuel loaded into the D3C16 core.

   [Reference: Letter from J.M. Heffley (JMHLTR #99-0080) (ComEd) to USNRC "Plant Specific ECCS Evaluation Changes - 10CFR50.46 Annual Report," dated July 10, 1999.]

6. Prior LOCA Model Assessment

   The 50.46 report dated July 10, 2000, assessed the impact of plant parameter changes in the LOCA evaluation model, new fuel loaded into the D2C17 core and the effects of loading D3C16 offset fuel next to the non-offset fuel. The assessments identified zero °F impact on PCT.

   [Reference: Letter from Preston Swafford (PSLTR: #00-0099) (ComEd) to USNRC, "Plant Specific ECCS Evaluation Changes - 10CFR50.46 Annual Report," July 10, 2000.]

Attachment 3
Dresden Nuclear Power Station Units 2 and 3
10 CFR 50.46 Report Assessment Notes

7. Unit 3 Cycle 17 Reload Fuel

   Impact of reload fuel on Unit 3 licensing PCT is zero °F.

   [References: "Dresden Unit 3 Cycle 17 Reload Analysis", EMF-2421 Revision 0, Siemens Power Corporation, July 2000.]

8. Incorrect implementation of Strain Correlations in HUXY

   The BALLON and BULGEX subroutines in HUXY use an incorrect term in the radial displacement calculation for the cladding. The impact of this error was estimated to be 1 °F.

   [Reference: Letter from J. F. Mallay (Framatome) to U.S. NRC, "2000 – Annual Reporting of Changes and Errors in ECCS Evaluation Models," NRC:01:013, dated February 26, 2001.]

9. Incorrect implementation of Wilson Bubble Rise Model in the FLEX code

   The Wilson Bubble Rise Model has two regions that used different empirical correlations. The transition logic in the FLEX code was found to contain an error resulting in a discontinuity between the regions. The impact of this error was estimated to be 1 °F.

   [References: Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "10 CFR 50.46 PCT Reporting for the Dresden Units," DEG:00:207, dated August 31, 2000.

   Letter from J. F. Mallay (Framatome) to U.S. NRC, "2000 – Annual Reporting of Changes and Errors in ECCS Evaluation Models," NRC:01:013, dated February 26, 2001.]

10. Incorrect implementation of Momentum Equation in the FLEX code

    The momentum equation in FLEX for pipe geometries adjacent to the break was missing an area divider in the ECCS flow term. This error is only relevant if the ECC flow is injected into the piping node next to the break. Dresden is not modeled in this way. Therefore, the impact of this error is reported as 0° F.

    [References: Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "10 CFR 50.46 PCT Reporting for the Dresden Units," DEG:00:207, dated August 31, 2000.

    Letter from J. F. Mallay (Framatome) to U.S. NRC, "2000 – Annual Reporting of Changes and Errors in ECCS Evaluation Models," NRC:01:013, dated February 26, 2001.

    Framatome ANP Condition Report 7806 Revision 2, "FLEX V&V Findings," dated September 21, 1999.]

11. Impact of FLEX code changes due to verification and validation activities

    In response to the 1997 NRC inspection, Framatome (formerly Siemens) committed to perform additional verification and validation of its key codes. A number of minor errors were identified and corrected in the FLEX code as part of this effort. The impact of this collective change is estimated to be 8° F.

    [References: Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "10 CFR 50.46 PCT Reporting for the Dresden Units," DEG:00:207, dated August 31, 2000.

    Letter from J. F. Mallay (Framatome) to U.S. NRC, "2000 – Annual Reporting of Changes and Errors in ECCS Evaluation Models," NRC:01:013, dated February 26, 2001.]