

June 8, 2002

10 CFR 50.46

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

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

Reference: (1) Letter from M. A. Schiavoni (Exelon) to U.S. NRC, "Plant
Specific ECCS Evaluation Changes – 10 CFR 50.46
Report," dated June 8, 2001.

In accordance with 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," Exelon Generation Company (EGC), LLC, submits the enclosed attachments to fulfill the annual reporting requirement for LaSalle County Station, Unit 1 and Unit 2. The previously calculated Peak Cladding Temperature (PCT) of 1301 degrees Fahrenheit (°F) for General Electric (GE) fuel and 1825°F for Framatome-ANP (FANP) fuel was reported in Reference 1. The PCT for GE fuel remains unchanged in this report, while the PCT for FANP fuel increased by 2°F to a value of 1827°F.

Both units employ a mixed core design containing co-resident GE and SPC fuel. The Loss of Coolant Accident (LOCA) analyses of record for both GE and SPC fuel are within all of the acceptance criteria set forth in 10 CFR 50.46.

Attachments 1 and 2 provide PCT information for the limiting LOCA evaluations for LaSalle County Station, Unit 1 and Unit 2, including all assessments as of June 12, 2001. The assessment notes are contained in Attachment 3 and provide a detailed description for each change or error reported.

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Should you have any questions concerning this letter, please contact
Mr. Glen Kaegi, Regulatory Assurance Manager, at (815) 415-2800.

Respectfully,

A handwritten signature in black ink, appearing to read "Mark A. Schiavoni". The signature is fluid and cursive, with the first name "Mark" being more prominent.

Mark A. Schiavoni
Plant Manager
LaSalle County Station

Attachments

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - LaSalle County Station

Attachment 1

LaSalle Units 1 and 2 10 CFR 50.46 Report (GE Fuel)

PLANT NAME: LaSalle Units 1 and 2
ECCS EVALUATION MODEL: SAFER/GESTR LOCA
REPORT REVISION DATE: June 8, 2002
CURRENT OPERATING CYCLES: L1C10 and L2C9

ANALYSIS OF RECORD

Evaluation Model Methodology: "GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident," Volumes I, II and III, NEDE-23785-1-P-A, dated February 1985.

Calculation: "Project Task Report, LaSalle County Station, Power Uprate Evaluation, Task 407: ECCS Performance," GE report number GE-NE-A1300384-39-01, Revision 1, dated September 1999.

Fuel: GE8x8NB (GE9)

Limiting Single Failure: HPCS Diesel Generator

Limiting Break Size and Location: 1.0 Double Ended Guillotine of Recirculation Pump Suction Piping

Reference PCT: 1301°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated June 12, 2000 (see Note 1)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 Report dated June 8, 2001 (see Note 2)	$\Delta PCT = 0^\circ F$
Net PCT	1301 °F

B. CURRENT LOCA MODEL ASSESSMENTS

None	$\Delta PCT = 0^\circ F$
Total PCT Change from Current Assessments	$\Sigma \Delta PCT = 0^\circ F$
Cumulative PCT Change from Current Assessments	$\Sigma \Delta PCT = 0^\circ F$
Net PCT	1301 °F

Attachment 2

LaSalle Units 1 and 2 10 CFR 50.46 Report (FANP Fuel)

PLANT NAME: LaSalle Units 1 and 2
ECCS EVALUATION MODEL: EXEM BWR Evaluation Model
REPORT REVISION DATE: June 8, 2002
CURRENT OPERATING CYCLE: L1C10 and L2C9

ANALYSIS OF RECORD

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

BWR Jet Pump Model Revision for RELAX, ANF-91-048(P)(A), Supplement 1 and Supplement 2, Siemens Power Corporation, October 1997.

Calculation:

1. LaSalle LOCA-ECCS Analysis MAPLHGR Limits for ATRIUM™-9B Fuel, EMF-2175(P), March 1999.
2. LOCA Break Spectrum Analysis for LaSalle Units 1 and 2, EMF-2174(P), March 1999.
3. LaSalle Units 1 and 2 LOCA-ECCS Analysis MAPLHGR Limit for ATRIUM™-10 Fuel, EMF-2641(P), November 2001.
4. LaSalle Units 1 and 2 LOCA Break Spectrum Analysis for ATRIUM™-10 Fuel, EMF-2639(P), November 2001.

Fuel: ATRIUM™-9B and ATRIUM™-10

Limiting Fuel ATRIUM™-9B

Limiting Single Failure: HPCS Diesel Generator

Limiting Break Size and Location: 1.1 ft² Recirculation Pump Discharge Side Line Break

Reference PCT: 1807 °F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated May 7, 1999 (See Note 3)	$\Delta PCT = 0$ °F
10 CFR 50.46 report dated February 20, 2000 (See Note 4)	$\Delta PCT = 18$ °F
10 CFR 50.46 report dated June 12, 2000 (See Note 5)	$\Delta PCT = 0$ °F
10 CFR 50.46 report dated June 8, 2001 (See Note 6)	$\Delta PCT = 0$ °F
Net PCT	1825 °F

Attachment 2

LaSalle Units 1 and 2 10 CFR 50.46 Report (FANP Fuel)

B. CURRENT LOCA MODEL ASSESSMENTS

Incorrect pellet dish volume terms in RDX2LSE fuel swelling calculation (see Note 7)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Reconciliation of RODEX2-2A numerical iteration scheme (see Note 8)	$\Delta PCT = 1\text{ }^{\circ}\text{F}$
Incorrect HUXY gadolinia conductivity model (see Note 9)	$\Delta PCT = -3\text{ }^{\circ}\text{F}$
Incorrect calculation start time for the BULGEX code (see Note 10)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Incorrect constant used in the rupture temperature calculation (see Note 11)	$\Delta PCT = 1\text{ }^{\circ}\text{F}$
Incorrect Zircaloy heat of reaction (see Note 12)	$\Delta PCT = 3\text{ }^{\circ}\text{F}$
Unit 1 Cycle 10 reload fuel (see Note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
ATRIUM-9B Exposure Extension (See Note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT Change from Current Assessments	$\sum \Delta PCT = 2\text{ }^{\circ}\text{F}$
Cumulative PCT Change from Current Assessments	$\sum \Delta PCT = 8\text{ }^{\circ}\text{F}$
Net PCT	1827 $^{\circ}\text{F}$

Attachment 3

LaSalle Units 1 and 2 10 CFR 50.46 Report Assessment Notes

1. Prior LOCA model assessment for GE fuel

The reference letter reported a new analysis of record for GE fuel as a result of the mid-cycle power uprate to 3489 MWt during Unit 1 Cycle 9 and Unit 2 Cycle 8.

[Reference: Letter from C. G. Pardee (ComEd) to U.S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated June 12, 2000.]

2. Prior LOCA model assessment for GE fuel

The reference letter assessed impact of Unit 2 LPCS riser leakage and errors in GE LOCA analysis model.

[Reference: Letter from M. A. Schiavoni (Exelon) to U.S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated June 8, 2001.]

3. Prior LOCA Model Assessment for FANP fuel

The May 1999 LOCA model assessment was a new analysis of record for Framatome (Formerly Siemens) due to the introduction of ATRIUM-9B fuel into the Unit 2 Cycle 8 core. Therefore, there is no PCT change. Analysis was performed for a core power of 3722 MWt that bounds the current uprated power of 3489 MWt.

[Reference: Letter from J. A. Benjamin (ComEd) to U.S. NRC, "Report of Significant Change in Calculated Peak Cladding Temperature (PCT) – 10CFR 50.46 Report," dated May 7, 1999.]

4. Prior LOCA Model Assessment for FANP fuel

The February 2000 50.46 report assessed the impact of errors in the LOCA evaluation model.

[Reference: Letter from J. A. Benjamin (ComEd) to U.S. NRC, "Plant Specific ECCS Evaluation Changes – 10CFR 50.46 Report," dated February 9, 2000.]

5. Prior LOCA Model Assessment for FANP fuel

The June 2000 10 CFR 50.46 report does not have any PCT assessment for ATRIUM-9B fuel.

[Reference: Letter from C. G. Pardee (ComEd) to U.S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated June 12, 2000.]

6. Prior LOCA model assessment for FANP fuel

The reference letter assessed impact of Unit 2 LPCS riser leakage, errors in FANP LOCA analysis model and Unit 2 Cycle 9 reload fuel.

[Reference: Letter from M. A. Schiavoni (Exelon) to U.S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated June 8, 2001.]

Attachment 3

LaSalle Units 1 and 2 10 CFR 50.46 Report Assessment Notes

7. Incorrect pellet dish volume terms in RDX2LSE fuel swelling calculation

The equation used in RDX2LSE to calculate the dish volume for swelling accommodation has an error resulting in the underestimation of the dish volume. The underestimation could affect predicted temperatures and gap conductances at moderate to high burnups.

[References:

Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.

Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "Transmittal of Condition Report 8266 and Associated Part 21 Evaluation Report," DEG:00:029, dated January 27, 2000.

8. Reconciliation of RODEX2-2A numerical iteration scheme

FANP created a new RODEX2-2A code by merging the RODEX2-2A code for rod mechanical design analyses and the RDX2LSE code for safety analyses. The previous codes used the same NRC approved models and they are equivalent but contained some differences in iteration schemes. The new code has reconciled the differences in iteration schemes.

[Reference: Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.

9. Incorrect HUXY gadolinia conductivity model

In 1998, Framatome discovered that the NRC approved gadolinia model was not incorporated into the RDX2LSE code. Additional investigation for the condition report revealed that the HUXY code contained the same error.

[References:

Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.

Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "Transmittal of Condition Report 6419 with Part 21 Evaluation Report," DEG:98:024, dated January 26, 1998.

10. Incorrect calculation start time for the BULGEX code

During the evaluation of a new version of the HUXY code to correct a user message, it was discovered that the BULGEX subroutine needed to be initiated at a much earlier time.

Attachment 3

LaSalle Units 1 and 2 10 CFR 50.46 Report Assessment Notes

[Reference: Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.]

11. Incorrect constant used in the rupture temperature calculation

The rupture temperature calculation over 950 °C in BULGEX incorrectly and non-conservatively rounds a constant parameter term.

[Reference: Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.]

12. Incorrect Zircaloy heat of reaction

The heat of reaction for zircaloy in the HUXY code is incorrect. The heat of reaction as a function of temperature does not account for the variation of the zircaloy heat capacity in the alpha-beta transformation temperature range.

[References:

Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "Transmittal of 10 CFR 50.46 Reporting for LaSalle Units, Condition Report 9008, and CMR 2156," DEG:01:108, dated July 17, 2001.

Letter from D. Garber (Siemens) to R. J. Chin (ComEd), "Transmittal of Condition Report 8168 R/1, with Part 21 Evaluation Report," DEG:99:349, dated December 22, 1999.

13. Unit 1 Cycle 10 reload fuel

LOCA analysis for the new fuel type (ATRIUM-10) shows its PCT to be less than the PCT of the limiting fuel type (ATRIUM-9B). Therefore, the PCT change is reported as 0 °F.

[Reference: "LaSalle Unit 1 Cycle 10 Reload Analysis," EMF-2690, Revision 0, Framatome ANP, January 2002.]

14. ATRIUM-9B Exposure Extension

LOCA analysis results show that the PCT for ATRIUM-9B fuel at the extended exposure of 64.3 GWd/MTU is non-limiting. Therefore, the PCT change is reported as 0 °F.

[Reference: Letter from D. Garber (FANP) to F. W. Trikur (Exelon), "ATRIUM-9B Exposure Extension MAPLHGR Analysis Results for LaSalle Units 1 and 2," DEG:02:024, January 22, 2002.]