

RS-13-068

10 CFR 50.46

March 7, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

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: Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation
Model Changes and Errors for LaSalle County Station

Reference: Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. NRC,
"Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated
March 7, 2012

In accordance with 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," paragraph (a)(3)(ii), Exelon Generation Company, LLC, (EGC) is submitting the attached information to fulfill the annual reporting requirements for LaSalle County Station (LSCS), Units 1 and 2. The attachments describe the changes in accumulated peak cladding temperature (PCT) since the previous annual report submitted in the referenced letter.

There are no regulatory commitments contained in this submittal. Should you have any questions concerning this letter, please contact Ms. Lisa A. Simpson at (630) 657-2815.

Respectfully,



David M. Gullott
Manager – Licensing
Exelon Generation Company, LLC

Attachments:

- 1) LaSalle County Station, Units 1 and 2 – 10 CFR 50.46 Report (GNF Fuel)
- 2) LaSalle County Station, Unit 1 – 10 CFR 50.46 Report (AREVA NP Fuel)
- 3) LaSalle County Station, Unit 2 – 10 CFR 50.46 Report (AREVA NP Fuel)
- 4) LaSalle County Station, Units 1 and 2 – 10 CFR 50.46 Report Assessment Notes

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cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, LaSalle County Station
NRR Project Manager, LaSalle County Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1
LaSalle County Station, Units 1 and 2
10 CFR 50.46 Report (GNF Fuel)

PLANT NAME: LaSalle County Station (LSCS), Units 1 & 2
ECCS EVALUATION MODEL: SAFER/PRIME LOCA
REPORT REVISION DATE: March 7, 2013
CURRENT OPERATING CYCLE: L1C15 and L2C15

ANALYSIS OF RECORD

Evaluation Model Methodology: NEDE-23785-1-PA, Rev. 1, "GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident (Volume III), SAFER/GESTR Application Methodology," October 1984.

"The PRIME Model for Analysis of Fuel Rod Thermal-Mechanical Performance", Technical Bases - NEDC-33256P-A, Qualification - NEDC-33257P-A, and Application Methodology - NEDC-33258P-A, September 2010.

NEDO-33173 Supplement 4-A, "Implementation of PRIME Models and Data in Downstream Methods," September 2011.

Calculation: GE Hitachi Calculation 0000-0121-8990-R0, "LaSalle County Station GNF2 ECCS-LOCA Evaluation," GE Hitachi Nuclear Energy, January 2012.

Fuel: GNF2

Limiting Single Failure: High Pressure Core Spray Diesel Generator

Limiting Break Size and Location: 0.08 ft² Recirculation Pump Suction Line Break

Reference Peak Cladding Temperature (PCT): 1540°F

ATTACHMENT 1
LaSalle County Station, Units 1 and 2
10 CFR 50.46 Report (GNF Fuel)

MARGIN ALLOCATION

A. PRIOR LOSS-OF-COOLANT ACCIDENT (LOCA) MODEL ASSESSMENTS

10 CFR 50.46 report dated March 7, 2012 (Note 7)	$\Delta PCT = 0^{\circ}F$
Net PCT	1540^oF

B. CURRENT LOCA MODEL ASSESSMENTS

None (Note 8)	$\Delta PCT = 0^{\circ}F$
Total PCT change from current assessments	$\sum \Delta PCT = 0^{\circ}F$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0^{\circ}F$
Net PCT	1540^oF

ATTACHMENT 2
LaSalle County Station, Unit 1
10 CFR 50.46 Report (AREVA NP Fuel)

PLANT NAME: LaSalle County Station (LSCS), Unit 1
ECCS EVALUATION MODEL: EXEM BWR-2000 Evaluation Model
REPORT REVISION DATE: March 7, 2013
CURRENT OPERATING CYCLES: L1C15

ANALYSIS OF RECORD

Evaluation Model Methodology: EMF-2361 (P)(A) Revision 0, EXEM BWR-2000 ECCS Evaluation Model, Framatome ANP, May 2001.

Calculation: EMF-3230 (P) Revision 0, LaSalle Units 1 and 2
EXEM BWR-2000 LOCA Break Spectrum Analysis for
ATRIUM-10 Fuel, November 2005.

EMF-3231 (P) Revision 0, LaSalle Units 1 and 2
EXEM BWR-2000 LOCA-ECCS Analysis MAPLHGR
Limit for ATRIUM-10 Fuel, November 2005.

Fuel: ATRIUM-10

Limiting Single Failure: Low Pressure Coolant Injection Diesel Generator

Limiting Break Size and Location: Double Ended Guillotine/0.8 discharge coefficient of Recirculation Pump Suction Piping

Reference Peak Cladding Temperature (PCT): 1729°F

ATTACHMENT 2
LaSalle County Station, Unit 1
10 CFR 50.46 Report (AREVA NP Fuel)

MARGIN ALLOCATION

A. PRIOR LOSS-OF-COOLANT ACCIDENT (LOCA) MODEL ASSESSMENTS

10 CFR 50.46 report dated August 28, 2006 (Note 1)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 30, 2007 (Note 2)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 28, 2008 (Note 3)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 27, 2009 (Note 4)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 9, 2010 (Note 5)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 8, 2011 (Note 6)	$\Delta PCT = 0^{\circ}F$
10 CFR 50.46 report dated March 7, 2012 (Note 7)	$\Delta PCT = 0^{\circ}F$
Net PCT	1729°F

B. CURRENT LOCA MODEL ASSESSMENTS

Thermal Conductivity Degradation (Note 9)	$\Delta PCT = 0^{\circ}F$
Total PCT change from current assessments	$\sum \Delta PCT = 0^{\circ}F$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0^{\circ}F$
Net PCT	1729°F

ATTACHMENT 3
LaSalle County Station, Unit 2
10 CFR 50.46 Report (AREVA NP Fuel)

PLANT NAME: LaSalle County Station (LSCS), Unit 2
ECCS EVALUATION MODEL: SAFER/PRIME LOCA
REPORT REVISION DATE: March 7, 2013
CURRENT OPERATING CYCLE: L2C15

ANALYSIS OF RECORD

Evaluation Model Methodology: NEDE-23785-1-PA, Rev. 1, "GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident (Volume III), SAFER/GESTR Application Methodology," October 1984.

"The PRIME Model for Analysis of Fuel Rod Thermal-Mechanical Performance", Technical Bases - NEDC-33256P-A, Qualification - NEDC-33257P-A, and Application Methodology - NEDC-33258P-A, September 2010.

NEDO-33173 Supplement 4-A, "Implementation of PRIME Models and Data in Downstream Methods," September 2011.

Calculation: GE Hitachi Calculation 0000-0142-8555-R0, "LaSalle County Station ECCS- LOCA Evaluation for ATRIUM-10 Fuel," GE Hitachi Nuclear Energy, April 2012.

Fuel: ATRIUM-10

Limiting Single Failure: High Pressure Core Spray Diesel Generator

Limiting Break Size and Location: 0.08 ft² Recirculation Pump Suction Line Break

Reference Peak Cladding Temperature (PCT): 1460°F

ATTACHMENT 3
LaSalle County Station, Unit 2
10 CFR 50.46 Report (AREVA NP Fuel)

MARGIN ALLOCATION

A. PRIOR LOSS-OF-COOLANT ACCIDENT (LOCA) MODEL ASSESSMENTS

None	$\Delta\text{PCT} = 0^\circ\text{F}$
Net PCT	1460°F

B. CURRENT LOCA MODEL ASSESSMENTS

None (Note 10)	$\Delta\text{PCT} = 0^\circ\text{F}$
Total PCT change from current assessments	$\sum\Delta\text{PCT} = 0^\circ\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta\text{PCT} = 0^\circ\text{F}$
Net PCT	1460°F

ATTACHMENT 4
LaSalle County Station, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

1. Prior LOCA Model Assessment for AREVA NP Fuel

An AREVA NP (formerly Framatome Advanced Nuclear Power (FANP)) LOCA evaluation was performed in November 2005 due to the discharge of ATRIUM-9 fuel and the reanalysis of the ATRIUM-10 fuel for LaSalle County Station (LSCS), Unit 1, Cycle 12 (L1C12). This analysis was reported to the NRC in the referenced letter. The AREVA NP analysis for cycle L2C12 demonstrated that the LOCA analysis performed for cycle L1C12 in November 2005 was applicable to cycle L2C12. The referenced letter also provided the Unit 2 peak cladding temperature (PCT) of 1832°F (i.e., including all assessments) for the AREVA NP fuel based on an acceptable model for a mixed core of ATRIUM-9 and ATRIUM-10, with ATRIUM-9 being the limiting fuel type. The ATRIUM-9 fuel has been discharged from the Unit 2 core, making ATRIUM-10 fuel the limiting fuel type with a PCT of 1729°F. For Unit 1, there were no changes for ATRIUM-10 fuel and the PCT remained at 1729°F.

[Reference: Letter from D. J. Enright (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated August 28, 2006.]

2. Prior LOCA Model Assessment for AREVA NP Fuel

The 10 CFR 50.46 report submitted to the NRC in the referenced letter did not report any LOCA model assessments for AREVA NP fuel.

[Reference: Letter from D. J. Enright (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 30, 2007.]

3. Prior LOCA Model Assessment for AREVA NP Fuel

During the performance of the LSCS, Unit 2 Reload 11 outage inspection of the Core Spray sparger, a bent flow deflector in one of the High Pressure Core Spray sparger nozzles was noted. AREVA NP performed an evaluation and determined that the impact of this bent flow deflector on the LOCA analyses was insignificant. A zero degree PCT impact was assigned. This evaluation was reported to the NRC in the referenced letter. This PCT impact was only applicable to LSCS, Unit 2.

[Reference: Letter from D. P. Rhoades (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 28, 2008.]

4. Prior LOCA Model Assessment for AREVA NP Fuel

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2009 reporting period. During the LSCS, Unit 2 Reload 12 outage, eight ATRIUM-10XM lead test assemblies (LTA) were loaded into the core. The PCT of the ATRIUM-10XM LTAs was less than the PCT for ATRIUM-10 fuel. The L1C14 core does not have any ATRIUM-10XM fuel.

[Reference: Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 27, 2009.]

ATTACHMENT 4
LaSalle County Station, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

5. Prior LOCA Model Assessment for AREVA NP Fuel

The 10 CFR 50.46 report submitted to the NRC in the referenced letter did not report any LOCA model assessments for AREVA NP fuel.

[Reference: Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 9, 2010.]

6. Prior LOCA Model Assessment for AREVA NP Fuel

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2 for the 2011 reporting period. The letter reported a RELAX code error. The RELAX code is part of the EXEM BWR-2000 LOCA methodology. Based on an assessment of LSCS Break Spectrum calculations, the impact on the analysis of record PCT was reported to be 0°F.

The referenced letter also reported the impact of the configuration change Allowable Air Void in ECCS – LPCI Piping. The configuration change revised the design basis to clarify that a small amount of air can exist in the LSCS, Division 1, Residual Heat Removal (RHR) – Low Pressure Core Injection (LPCI) piping. As reported in the referenced letter, this change had a 0°F impact on the analysis of record PCT for AREVA fuel types.

The referenced letter also reported the measurement uncertainty recapture (MUR) power uprate implemented at LSCS, Unit 1, during Cycle 14. The MUR power uprate had a 0°F impact on the analysis of record PCT for the AREVA fuel in LSCS, Unit 1.

[Reference: Letter from J. L. Hansen (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 8, 2011.]

7. Prior LOCA Model Assessment for AREVA NP Fuel and GNF Fuel

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2012 reporting period. The letter reported the introduction of GNF2 Fuel into the LSCS, Unit 1 core.

The referenced letter also reported the MUR power uprate implemented at LSCS, Unit 2, during Cycle 14. The MUR power uprate had a 0°F impact on the analysis of record PCT for the AREVA fuel in LSCS, Unit 2.

[Reference: Letter from D. M. Gullott (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated March 7, 2012.]

8. Current LOCA Model Assessment for GNF Fuel

Since the last annual report, the GNF2 fuel design has been introduced into the LSCS, Unit 2 core. Additionally, since the last annual report, no vendor notifications of Emergency Core Cooling System (ECCS) model errors/changes applicable to the GNF2 fuel in LSCS, Units 1 and 2, have been issued. Assessment Notes 1 through 6 are not applicable to GNF2 fuel. No ECCS related changes or modifications have occurred at LSCS that affect the assumptions in the LOCA analysis of record.

ATTACHMENT 4
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10 CFR 50.46 Report Assessment Notes

9. Current LOCA Model Assessment for AREVA NP Fuel (AREVA NP Analysis of Record)

The referenced report provides the impact of thermal conductivity degradation on the AREVA NP LOCA analysis of record. The referenced report states that an assessment of thermal conductivity degradation on the calculated PCT for ATRIUM-10 fuel was performed and the estimated impact on the LSCS ATRIUM-10 fuel analysis of record PCT is 0°F. No ECCS related changes or modifications have occurred at LSCS that affect the assumptions in the AREVA NP LOCA analysis of record for the ATRIUM-10 fuel in LSCS, Unit 1.

[Reference: AREVA Engineering Information Record 51-9182748-000, "10 CFR 50.46 PCT Reporting for the LSCS Units – Thermal Conductivity Degradation," transmitted in Letter from A.W. Will (AREVA) to J. T. Fisher (Exelon Generation Company, LLC), AWW:12:018 / FAB12-2212, dated June 8, 2012.]

10. Current LOCA Model Assessment for AREVA NP Fuel (GEH Analysis of Record)

Since the last annual report, a new LOCA analysis of record for the ATRIUM-10 fuel in LSCS, Units 1 and 2 was performed by GE Hitachi Nuclear Energy (GEH). The referenced report has only been implemented at LSCS, Unit 2. Assessment Notes 1 through 9 are not applicable to the ATRIUM-10 fuel in LSCS, Unit 2. No ECCS related changes or modifications have occurred at LSCS that affect the assumptions in the GEH LOCA analysis of record for the ATRIUM-10 fuel in LSCS, Unit 2.

[Reference: GE Hitachi Calculation 0000-0142-8555-R0, "LaSalle County Station ECCS-LOCA Evaluation for ATRIUM-10 Fuel," GE Hitachi Nuclear Energy, dated April 2012.]