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RS-20-024

10 CFR 50.46

March 9, 2020

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

LaSalle County Station, Units 1 and 2
Renewed 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

References:
1. Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2019

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 Reference 1.

There are no regulatory commitments contained in this submittal. Should you have any questions concerning this letter, please contact Mr. Jason Taken at (630) 657-3660.

Respectfully,

Dwi Murray
Senior Manager - Licensing
Exelon Generation Company, LLC

Attachments:
1) LaSalle County Station, Units 1 and 2 – 10 CFR 50.46 Report
2) LaSalle County Station, Units 1 and 2 – 10 CFR 50.46 Report Assessment Notes

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, 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

PLANT NAME: LaSalle County Station (LSCS), Units 1 & 2

ECCS EVALUATION MODEL: SAFER/PRIME LOCA

REPORT REVISION DATE: February 24, 2020

CURRENT OPERATING CYCLES: L1C19 and L2C18

ANALYSES OF RECORD

1) General Electric Hitachi (GEH) Calculation 0000-0121-8990-R0, "LaSalle County Station GNF2 ECCS-LOCA Evaluation," GEH Nuclear Energy, January 2012

2) GNF Document Number 002N3086.1, "Technical Evaluation to Support Introduction of GNF3 Lead Use Assemblies (LUAs) in LaSalle County Station, Unit 2," Global Nuclear Fuel, December 2014

Fuel Types:	GNF2, GNF3 LUAs
Limiting Single Failure:	High Pressure Core Spray Diesel Generator Failure
Limiting Break Size & Location:	Recirculation Pump Suction Line Break (0.08 ft² in small break)
Reference Peak Cladding Temperature (PCT):	GNF2: 1540°F GNF3 LUAs: 1550°F

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

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated March 7, 2012 (Note 1)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	N/A
10 CFR 50.46 Report dated March 7, 2013 (Note 2)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	N/A
10 CFR 50.46 Report dated March 7, 2014 (Note 3)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	N/A
10 CFR 50.46 Report dated March 6, 2015 (Note 4)	GNF2:	ΔPCT = -5ºF
	GNF3 LUA:	ΔPCT = 0ºF
10 CFR 50.46 Report dated March 7, 2016 (Note 5)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	ΔPCT = 0ºF
10 CFR 50.46 Report dated March 7, 2017 (Note 6)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	ΔPCT = 0ºF
10 CFR 50.46 Report dated March 7, 2018 (Note 7)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	ΔPCT = 0ºF
10 CFR 50.46 Report dated March 7, 2019 (Note 8)	GNF2:	ΔPCT = 0ºF
	GNF3 LUA:	ΔPCT = 0ºF
Net PCT	**GNF2:**	**1535ºF**
	GNF3 LUA:	**1550ºF**

B. CURRENT LOCA MODEL ASSESSMENTS

Total PCT Change from Current Assessments (Note 9)	GNF2:	Σ ΔPCT = 0ºF
	GNF3 LUA:	Σ ΔPCT = 0ºF
Cumulative PCT Change from Current Assessments	GNF2:	Σ |ΔPCT| = 0ºF
	GNF3 LUA:	Σ |ΔPCT| = 0ºF
Net PCT	**GNF2:**	**1535ºF**
	GNF3 LUA:	**1550ºF**

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

ASSESSMENT NOTES

1. **Prior LOCA Assessment**

   The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2012 reporting period. The referenced letter reported the introduction of GNF2 fuel into the LSCS, Unit 1 core. A new LOCA analysis of record for GNF2 fuel was performed by GE Hitachi Nuclear Energy (GEH). No Emergency Core Cooling System (ECCS) related changes or modifications occurred at LSCS that affected the assumptions in the GEH GNF2 LOCA analysis.

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

2. **Prior LOCA Assessment**

   The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2013 reporting period. The referenced letter reported the introduction of GNF2 fuel into the LSCS, Unit 2 core. The referenced letter also reported no vendor notifications of ECCS model errors/changes applicable to the GNF2 fuel in LSCS, Units 1 and 2, and reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH GNF2 LOCA analysis for the GNF2 fuel in LSCS, Units 1 and 2.

   [Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2013]

3. **Prior LOCA Assessment**

   The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2014 reporting period. The referenced letter reported no vendor notifications of ECCS model errors/changes applicable to the GNF2 fuel in LSCS, Units 1 and 2, and reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH GNF2 LOCA analysis for the GNF2 fuel in LSCS, Units 1 and 2.

   [Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2014]

4. **Prior LOCA Assessment**

   The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2015 reporting period. The referenced letter reported four vendor notifications,

Notifications 2014-01 through 2014-04, of ECCS model error/changes. The first notification addressed several code maintenance changes to the SAFER04A model, which resulted in a PCT change of 0°F for GNF2. The second notification corrected a logic error, which affects the ECCS flow credited as reaching the core. Correction of this error resulted in a 0°F PCT change for GNF2. The third notification addressed an error with the imposed minimum pressure differential (Δp) for droplet flow above a two-phase level in the core. This error can offer an inappropriate steam cooling benefit above the core two phase level. Correction of this error resulted in a PCT change of -10°F for GNF2. The fourth notification addressed an incorrect pressure head representation when defining the counter current flow limitation (CCFL). Correction of this error resulted in a +5°F PCT change for GNF2.

The referenced letter also reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH LOCA analysis for the GNF2 fuel in LSCS, Units 1 and 2.

Four (4) GNF3 Lead Use Assemblies (LUAs) were loaded into LSCS, Unit 2, during the LSCS, Unit 2 Reload 15 outage (L2R15). Notifications 2014-01 through 2014-04 were included in the determination of the licensing basis PCT for the GNF3 LUAs.

[Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 6, 2015]

5. Prior LOCA Assessment

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2016 reporting period. The referenced letter reported no vendor notifications of ECCS model errors/changes applicable to the GNF2 fuel in LSCS, Units 1 and 2, and reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH GNF2 LOCA analysis of record for the GNF2 fuel in LSCS, Units 1 and 2.

The referenced letter reported no vendor notifications of ECCS model errors/changes applicable to the GNF3 fuel in LSCS, Unit 2, and that no ECCS related changes or modifications occurred at LSCS, Unit 2, that affected the assumptions in the GEH GNF3 LOCA analysis of record for the GNF3 fuel in LSCS, Unit 2. All ATRIUM-10 fuel was removed from LSCS, Unit 1 during the LSCS, Unit 1 Reload 16 (L1R16) outage prior to startup of LSCS, Unit 1 Cycle 17 (L1C17).

[Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2016]

6. Prior LOCA Assessment

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2017 reporting period. The referenced letter reported no vendor notification of the ECCS model errors/changes applicable to the GNF2 or GNF3 fuel in LSCS, Units 1 and 2 and reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH LOCA analyses for GNF2 or GNF3 fuel at LSCS, Units 1 and 2.

The letter also noted that all ATRIUM-10 fuel was removed from LSCS, Unit 2 prior to the start of LSCS, Unit 2 Cycle 17 (L2C17).

[Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2017]

7. Prior LOCA Assessment

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2018 reporting period. The referenced letter reported two vendor notifications were produced, 2017-01 and 2017-02. Notification 2017-01 describes corrections made to the GNF2 lower tie plate modeling and Notification 2017-02 describes corrections made to the fuel rod upper plenum thermal model. Neither of these corrections resulted in a change in PCT for either GNF2 or GNF3.

[Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2018]

8. Prior LOCA Assessment

The referenced letter provided the annual 10 CFR 50.46 report for LSCS, Units 1 and 2, for the 2019 reporting period. The referenced letter reported no vendor notifications of the ECCS model errors/changes applicable to the GNF2 or GNF3 fuel in LSCS, Units 1 and 2 and reported that no ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH LOCA analyses for GNF2 or GNF3 fuel at LSCS, Units 1 and 2.

[Reference: Letter from David M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Annual 10 CFR 50.46 Report of Emergency Core Cooling System Evaluation Model Changes and Errors for LaSalle County Station," dated March 7, 2019]

9. Current LOCA Assessment

Since the last annual 10 CFR 50.46 report, one vendor notification of ECCS model errors/changes applicable to the GNF2 fuel in LSCS, Units 1 and 2 and the GNF3 LUAs

in LSCS, Unit 2 has been issued. The driving differential pressure for the lower limit for the control rod guide tube to control rod driving housing interface backward leakage path was found to be incorrect in SAFER. A SAFER version correcting this error was executed on representative plants and confirmed the software code and error had no impact on the plant ECCS LOCA evaluations, and reported a 0° F impact of PCT.

No ECCS related changes or modifications occurred at LSCS that affected the assumptions in the GEH GNF2 LOCA analysis of record for the GNF2 fuel in LSCS, Units 1 and 2. No ECCS related changes or modifications occurred at LSCS, Unit 2, that affected the assumptions in the GEH GNF3 LOCA analysis of record for the GNF3 fuel in LSCS, Unit 2.