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10 CFR 50.46

NMP1L3325

January 27, 2020

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

Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-63 and NPF-69
NRC Docket Nos. 50-220 and 50-410

Subject: 10 CFR 50.46 Annual Report

Reference: 1) Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 25, 2019.

The purpose of this letter is to submit the 10 CFR 50.46 annual reporting information for Nine Mile Point Nuclear Station (NMP). Since the submittal of Reference 1, vendor notifications 2019-01 and 2019-02 were issued against the NMP Unit 1 TRACG-LOCA analysis and notification 2019-05 was issued against NMP Unit 2 SAFER anlysis for both GE14 and GNF2 fuel. These notifications are included in this report.

Three attachments are included with this letter that provide the current NMP 10 CFR 50.46 status. Attachments 1 and 2 provide the Peak Cladding Temperature and the rack-up sheets for the NMP Unit 1 and NMP Unit 2 LOCA analyses, respectively. Attachment 3, "Assessment Notes," contains a detailed description of each change/error reported.

There are no commitments contained in this letter. If you have any questions, please contact Ron Reynolds at 610-765-5247.

Respectfully,

David T. Gudger
Senior Manager - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachments:
1) Peak Cladding Temperature Rack-Up Sheet for NMP Unit 1
2) Peak Cladding Temperature Rack-Up Sheet for NMP Unit 2
3) Assessment Notes, NMP

cc: USNRC Administrator, Region I
USNRC Senior Project Manager, NMP
USNRC Senior Resident Inspector, NMP

ATTACHMENT 1

10 CFR 50.46
"Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors"

Annual Report of the Emergency Core Cooling System Evaluation Model Changes and Errors

Assessments as of January 27, 2020

Peak Cladding Temperature Rack-Up Sheet for NMP Unit 1

Nine Mile Point Nuclear Station, Unit 1

PLANT NAME: Nine Mile Point Nuclear Station, Unit 1
ECCS EVALUATION MODEL: TRACG-LOCA
REPORT REVISION DATE: 1/27/2020
CURRENT OPERATING CYCLE: 24

ANALYSIS OF RECORD

1. 002N3714, Revision 0, Nine Mile Point Nuclear Station Unit 1 TRACG-LOCA Loss-of-Coolant Accident Analysis for GNF2 Fuel, March 2017

Fuel Analyzed in Calculations and in Operation: GNF2
Limiting Fuel Type: GNF2
Limiting Single Failure: 1 Diesel Generator
Limiting Break Size and Location: Recirculation Discharge 200% (7.233 ft^2) split break at 100% power and flow
Reference Peak Cladding Temperature (PCT): GNF2 = 2105°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated January 27, 2017 (Note 1)	ΔPCT = N/A
10 CFR 50.46 Report dated January 26, 2018 (Note 2)	ΔPCT = -8°F
10 CFR 50.46 Report dated January 25, 2019 (Note 3)	ΔPCT = 0°F
NET PCT	**2097°F**

B. CURRENT LOCA MODEL ASSESSMENTS

Notification 2019-01 (Note 4)	ΔPCT = 0°F
Notification 2019-02 (Note 4)	ΔPCT = 0°F
Total PCT change from current assessments	$\sum\Delta PCT$ = 0°F
Cumulative PCT change from current assessments	$\sum \lvert\Delta PCT\rvert$ = 0°F
NET PCT	**2097°F**

ATTACHMENT 2

10 CFR 50.46
"Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors"

Annual Report of the Emergency Core Cooling System Evaluation Model Changes and Errors

Assessments as of January 27, 2020

Peak Cladding Temperature Rack-Up Sheet for NMP Unit 2

Nine Mile Point Nuclear Station, Unit 2

PLANT NAME: Nine Mile Point Nuclear Station, Unit 2
ECCS EVALUATION MODEL: SAFER/PRIME
REPORT REVISION DATE: 1/27/2020
CURRENT OPERATING CYCLE: 17

ANALYSES OF RECORD

1. 0000-0162-4214-R0 Rev. 0, "Supplemental Project Task Report Constellation Energy Nuclear Group Nine Mile Point Nuclear Station Unit 2 MELLLA+ Task T0407: ECCS-LOCA SAFER/PRIME," August 2013.

2. 002N4205-R0, "Nine Mile Point Unit 2 GNF2 ECCS-LOCA Evaluation," December 2015

Fuel Analyzed in Calculations and in Operation: GE14, GNF2
Limiting Fuel Type: GNF2
Limiting Single Failure: High Pressure Core Spray – Diesel Generator
Limiting Break Size and Location: 0.07 ft^2 Recirculation Suction Line Break
Reference Peak Cladding Temperature (PCT): GE14 = 1580°F, GNF2 = 1690°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated January 29, 2016 (Note 5)	GE14: ΔPCT = 20°F
10 CFR 50.46 Report dated January 27, 2017 (Note 6)	GE14: ΔPCT = 0°F GNF2: ΔPCT = N/A
10 CFR 50.46 Report dated January 26, 2018 (Note 7)	GE14: ΔPCT = 0°F GNF2: ΔPCT = 0°F
10 CFR 50.46 Report dated January 25, 2019 (Note 8)	GE14: ΔPCT = N/A GNF2: ΔPCT = N/A
NET PCT	**GE14: 1600°F** **GNF2: 1690°F**

B. CURRENT LOCA MODEL ASSESSMENTS

Notification 2019-05 (Note 9)	GE14: ΔPCT = 0°F GNF2: ΔPCT = 0°F
Total PCT change from current assessments	GE14: $\sum\Delta PCT = 0°F$ GNF2: $\sum\Delta PCT = 0°F$
Cumulative PCT change from current assessments	GE14: $\sum \lvert\Delta PCT\rvert = 0°F$ GNF2: $\sum \lvert\Delta PCT\rvert = 0°F$
NET PCT	**GE14: 1600°F** **GNF2: 1690°F**

ATTACHMENT 3

10 CFR 50.46
"Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors"

Annual Report of the Emergency Core Cooling System Evaluation Model Changes and Errors

Assessments as of January 27, 2020

Assessment Notes, NMP

Nine Mile Point Nuclear Station

1) Prior LOCA Assessments (Unit 1)

Subsequent to the Reference 1 10 CFR 50.46 annual report, NMP Unit 1 replaced its existing SAFER/CORECOOL/PRIME analysis with a new TRACG-LOCA analysis [Reference 2]. The TRACG-LOCA analysis was implemented concurrent with the start of fuel Cycle 23. Because all GE11 fuel was discharged prior to Cycle 23, Cycle 23 contains a full core of GNF2 fuel, and the TRACG-LOCA analysis is applicable to GNF2 fuel only. No SAFER/CORECOOL/PRIME notifications were received between the last 10 CFR 50.46 annual report and the start of Cycle 23.

[Reference 1: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 27, 2017]

[Reference 2: 002N3714, Revision 0, Nine Mile Point Nuclear Station Unit 1 TRACG-LOCA Loss-of-Coolant Accident Analysis for GNF2 Fuel, March 2017]

2) Prior LOCA Model Assessments (Unit 1)

Subsequent to TRACG-LOCA implementation (Note 1), one notification was received. Notification 2017-03 describes a counter-current flow limitation coefficient that was incorrectly applied within the bypass region. The PCT impact was estimated to be -8°F.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 26, 2018]

3) Prior LOCA Model Assessments (Unit 1)

Subsequent to the previous 10 CFR 50.46 report (Note 2), one notification was received. Notification 2018-01 describes that, for some uncertainties, standard deviation were used that are inconsistent with the values approved by TRACG-LOCA Licensing Topical Report. An analysis was performed using the approved standard deviations, and the results showed that the effect was not statistically significant.. The PCT impact was estimated to be 0°F.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 25, 2019]

4) Current LOCA Model Assessment (Unit 1)

Subsequent to the previous 10 CFR 50.46 report (Note 3), two notifications were received. Notification 2019-01 describes that channel inlet subcooling was found to be incorrect in TRACG when multiple unheated nodes were modeled. Notification 2019-02 describes that the radiation heat transfer was found to be incorrect in TRACG due to a memory overwrite in the computer software. For each error, the PCT impact was estimated to be 0°F.

5) Prior LOCA Model Assessments (Unit 2)

During 2015, Unit 2 implemented a new GE14 LOCA analysis for MELLLA+. All prior GE14 error notifications were incorporated into the new analysis.

Subsequently, a new 10 CFR 50.46 notification was received from the vendor. Notification 2015-01 addressed an error whereby the ECCS-LOCA evaluation applied the method's default feedwater coast-down time rather than the customer-supplied value. Correction of this error was estimated to increase the GE14 licensing basis PCT by 20°F.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 29, 2016]

6) Prior LOCA Model Assessments (Unit 2)

Subsequent to the previous 10 CFR 50.46 report (Note 5), one 10 CFR 50.46 notification was received. Notification 2016-01 identified that an incorrect steam dryer pressure drop was used to adjust the initial vessel water level used by the MELLLA+ ECCS-LOCA analysis for GE14 fuel. Correction of that error was estimated to have no impact upon the GE14 Licensing Basis PCT.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 27, 2017]

7) Prior LOCA Model Assessments (Unit 2)

Subsequent to the previous 10 CFR 50.46 report (Note 6), two notifications were received from the vendor. Notification 2017-01 describes an incorrect assumption of lower tie plate leakage with an estimated PCT impact of 0°F for GNF2 fuel only. Notification 2017-02 describes a change in the fuel rod upper plenum modeling with an estimated PCT impact of 0°F for both GE14 and GNF2 fuel.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 26, 2018]

8) Prior LOCA Model Assessments (Unit 2)

Subsequent to the previous 10 CFR 50.46 report (Note 7), no notifications were received.

[Reference: Letter from J. Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated January 25, 2019]

9) Current LOCA Model Assessments (Unit 2)

Subsequent to the previous 10 CFR 50.46 report (Note 8), one notification was received from the vendor. Notification 2019-05 describes that the driving differential pressure for forward and backward bypass leakage is limited with an upper and lower limit in SAFER, and that all the limits were implemented correctly on all nine leakage paths except for one, the lower limit for the control rod guide tube to control rod drive housing interface backward leakage path. The estimated PCT impact of 0°F for both GE14 and GNF2 fuel.