

10 CFR 50.46

August 10, 2018

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: 10 CFR 50.46 Annual Report

Reference: Letter from David T. Gudger (Exelon Generation Company, LLC) to the U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated August 10, 2017

The purpose of this letter is to transmit the 10 CFR 50.46 reporting information for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The previous 50.46 report for PBAPS, Units 2 and 3, (Reference) provided the cumulative Peak Cladding Temperature (PCT) errors for the most recent fuel designs through August 10, 2017.

No new 10 CFR 50.46 notifications were received from the fuel vendor since the last 2017 annual report (Reference) submitted to NRC. Therefore, the total PCT value of 1925°F reported in the last annual report (Reference) is unchanged for this report.

There are no regulatory commitments in this letter.

U.S. NRC Regulatory Commission
Peach Bottom Atomic Power Station, Units 2 and 3
10 CFR 50.46 Report
August 10, 2018
Page 2

If you have any questions concerning this letter, please contact Richard Gropp at 610-765-5557.

Respectfully,

A handwritten signature in black ink, appearing to read "David T. Gudger". The signature is fluid and cursive, with the first name "David" being the most prominent.

David T. Gudger
Manager, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1. Peach Bottom Unit 2 | SAFER/PRIME | GNF2 Fuel
 10 CFR 50.46 Report
 2. Peach Bottom Unit 3 | SAFER/PRIME | GNF2 Fuel
 10 CFR 50.46 Report
 3. Assessment Notes

cc: w/Attachments
 USNRC Region I, Regional Administrator
 USNRC Senior Resident Inspector, PBAPS
 USNRC Project Manager, PBAPS
 R. R. Janati, Pennsylvania Bureau of Radiation Protection
 D. A. Tancabel, State of Maryland

ATTACHMENT 1

**Peach Bottom Unit 2 | SAFER/PRIME | GNF2 Fuel
10 CFR 50.46 Report**

PLANT NAME: Peach Bottom Unit 2
ECCS EVALUATION MODEL: SAFER/PRIME
EVALUATION MODEL VENDOR: GNF/GEH
REPORT REVISION DATE: August 10, 2018
CURRENT OPERATING CYCLE: 22

ANALYSIS OF RECORD CALCULATIONS

1. Project Task Report, Exelon Generation Company LLC, Peach Bottom Atomic Power Station, Units 2 & 3 MELLLA+ Task T0407: ECCS-LOCA Performance, 0000-0162-2354-R0, Revision 0, (PLM 000N0296 Revision 0), December 2013.

Fuels Analyzed in Calculations and in Operation: GNF2
Limiting Fuel Type: GNF2
Limiting Single Failure: Battery Failure
Limiting Break Location: Recirculation Discharge Line
Limiting Break Size: 0.05 ft² (Small Break)

Reference Peak Cladding Temperature (PCT) for GNF2 Fuel: 1920° F

MARGIN ALLOCATION

A. PRIOR LOCA ASSESSMENTS (Note 1):

10 CFR 50.46 Report dated August 15, 2014 (Note 1.1)	GNF2: $\Delta PCT = +5^{\circ}F$
10 CFR 50.46 Report dated August 10, 2016 (Note 1.2)	GNF2: $\Delta PCT = 0^{\circ}F$
10 CFR 50.46 Report dated August 10, 2017 (Note 1.3)	GNF2: $\Delta PCT = 0^{\circ}F$
Net PCT	GNF2: 1925°F

B. CURRENT LOCA ASSESSMENTS (Note 2):

Total PCT Change from Current Assessments (Note 2)	GNF2: $\sum \Delta PCT = 0^{\circ}F$
Cumulative PCT Change from Current Assessments	GNF2: $\sum \Delta PCT = 0^{\circ}F$
Net PCT	GNF2: 1925°F

ATTACHMENT 2

**Peach Bottom Unit 3 | SAFER/PRIME | GNF2 Fuel
10 CFR 50.46 Report**

PLANT NAME: Peach Bottom Unit 3
ECCS EVALUATION MODEL: SAFER/PRIME
EVALUATION MODEL VENDOR: GNF/GEH
REPORT REVISION DATE: August 10, 2018
CURRENT OPERATING CYCLE: 22

ANALYSIS OF RECORD CALCULATIONS

1. Project Task Report, Exelon Generation Company LLC, Peach Bottom Atomic Power Station, Units 2 & 3 MELLLA+ Task T0407: ECCS-LOCA Performance, 0000-0162-2354-R0, Revision 0, (PLM 000N0296 Revision 0), December 2013.

Fuels Analyzed in Calculations and in Operation: GNF2
Limiting Fuel Type: GNF2
Limiting Single Failure: Battery Failure
Limiting Break Location: Recirculation Discharge Line
Limiting Break Size: 0.05 ft² (Small Break)

Reference Peak Cladding Temperature (PCT) for GNF2 Fuel: 1920 °F

MARGIN ALLOCATION

A. PRIOR LOCA ASSESSMENTS (Note 1):

10 CFR 50.46 Report dated August 15, 2014 (Note 1.1)	GNF2: $\Delta PCT = +5^{\circ}F$
10 CFR 50.46 Report dated August 10, 2016 (Note 1.2)	GNF2: $\Delta PCT = 0^{\circ}F$
10 CFR 50.46 Report dated August 10, 2017 (Note 1.3)	GNF2: $\Delta PCT = 0^{\circ}F$
Net PCT	GNF2: 1925°F

B. CURRENT LOCA ASSESSMENTS (Note 2):

Total PCT Change from Current Assessments (Note 2)	GNF2: $\sum \Delta PCT = 0^{\circ}F$
Cumulative PCT Change from Current Assessments	GNF2: $\sum \Delta PCT = 0^{\circ}F$
Net PCT	GNF2: 1925°F

ATTACHMENT 3

**Assessment Notes
10 CFR 50.46 Report**

Assessment Notes

1. Prior LOCA Assessment

The last 10 CFR 50.46 annual report submitted to NRC was in August 10, 2017 (Reference 1). This report documents a Net PCT of 1925°F: a licensing basis PCT of 1920°F from the analysis of record report, and a total PCT adder of +5°F for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

[Reference 1: Letter from David T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated August 10, 2017.]

1.1. Prior LOCA Assessment - 2014

The referenced letter reported four vendor notifications that were received.

1. The first notification addressed several accumulated updates to the SAFER04A model. The code maintenance changes had an individually and collectively insignificant effect on calculated peak cladding temperature.
2. The second notification was for a correction to a logic error that was isolated, occurring with an indication that the expected systems mass diverged from the calculated actual system mass. This error affected the Emergency Core Cooling System (ECCS) flow credited as reaching the core. Correction of this error resulted in a +10°F Peak Cladding Temperature (PCT) change for GNF2 fuel.
3. 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 could have offered an inappropriate steam cooling benefit above the core two phase level. To correct this error an explicit core pressure drop calculation was applied without regard to droplet condition resulting in a PCT of -10°F for GNF2 fuel.
4. The forth 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 fuel.

Note that the 10 CFR 50.46 notifications discussed in the referenced report are applicable to the Unit 2 and Unit 3 MELLLA+ LOCA analysis and the net effect of these notifications is +5°F

[Reference: Letter from James Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated August 15, 2014.]

1.2. Prior LOCA Assessment - 2016

The referenced letter reported that PBAPS, Units 2 and 3, implemented Maximum Extended Load Line Limit Analysis Plus (MELLLA+) for which a new LOCA analysis was performed. PBAPS, Units 2 and 3, transitioned to MELLLA+ operation mid-cycle in April 2016 and May 2016, respectively. The error notifications reported in Assessment Note 1 are applicable to the PBAPS, Units 2 and 3, MELLLA+ LOCA analysis. The notifications were issued subsequent to the performance of the MELLLA+ LOCA analysis, but prior to its implementation.

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

1.3. Prior LOCA Assessment - 2017

The referenced letter reported two (2) vendor notifications regarding Emergency Core Cooling System (ECCS) modeling changes/errors applicable to PBAPS (Notifications 2017-01 and 2017-02). These notifications described issues related to the improper modelling of lower tie plate leakage for the GNF2 fuel design and changes to modeling of the fuel rod plenum for 10x10 fuel. Correction of these errors each resulted in a 0°F PCT change for GNF2 fuel.

The referenced letter reported a change in the Level 3 setpoint. The impact of this change on the Loss of Coolant Accident (LOCA) analysis was assessed in GNF Report 003N4534-R0, "Peach Bottom Level 3 Analytical Limit Reduction," dated May 25, 2016, which concluded that there is no impact on the licensing basis PCT for PBAPS.

[Reference: Letter from David T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 Annual Report," dated August 10, 2017.]

2. Current LOCA Assessment

No new 50.46 notifications were received from the fuel vendor since issuance of the last annual report (Reference 1 in Note 1). Therefore, the total PCT value of 1925°F reported in the last annual report is unchanged for this report.