



10 CFR 50.46

LR-N23-0065
2 October 2023

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

Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: 2023 Annual 10 CFR 50.46 Report

PSEG Nuclear LLC (PSEG) submits the attached documents for Hope Creek Generating Station in accordance with 10 CFR 50.46(a)(3)(ii). This letter and its attachments satisfy the annual reporting requirement.

For the current operating cycle, Cycle 25, the Hope Creek core consists only of GNF2 fuel assemblies.

There are no regulatory commitments in this correspondence.

Should you have any questions regarding this submittal, please contact Mr. Frank Safin at (856) 339-1937.

Sincerely,

Agster,
Thomas R.

Digitally signed by
Agster, Thomas R.
Date: 2023.10.02
12:16:57 -04'00'

Thomas R. Agster
Plant Manager, Hope Creek Generating Station

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Attachment 1: Hope Creek Generating Station 10 CFR 50.46 Report - Peak Cladding
Temperature Rack-up Sheet

Attachment 2: Hope Creek Generating Station 10 CFR 50.46 Report - Assessment Notes

cc: USNRC Regional Administrator – Region 1
USNRC Project Manager – Hope Creek
USNRC Senior Resident Inspector – Hope Creek
NJ Bureau of Nuclear Engineering
Corporate Commitment Coordinator, PSEG Nuclear, LLC

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Attachment 1
Hope Creek Generating Station 10 CFR 50.46 Report
Peak Cladding Temperature Rack-up Sheet
(2 pages)

**Hope Creek Generating Station 10 CFR 50.46 Report
Peak Cladding Temperature Rack-up Sheet
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PLANT NAME: Hope Creek Generating Station
 ECCS EVALUATION MODEL: SAFER/GESTR-PRIME
 REPORT REVISION DATE: 9/19/2023
 CURRENT OPERATING CYCLE: 25

ANALYSIS OF RECORD

Evaluation Model: 1. The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident, Volume III, SAFER/GESTR Application Methodology, NEDE-23785-1-PA, General Electric Company, Revision 1, October 1984.

2. Licensing Topical Report, The PRIME Model for Analysis of Fuel Rod Thermal-Mechanical Performance, Part 1 – Technical Bases, NEDC-33256P-A, Revision 1, Part 2 – Qualification, NEDC-33257P-A, Revision 1, and Part 3 – Application Methodology, NEDC-33258P-A, Revision 1, September 2010. (See Assessment Note 1)

Calculations: Hope Creek Generating Station GNF2 ECCS-LOCA Evaluation, 002N5176-R0, Revision 0, August 2016.

Fuel: GNF2

Limiting Fuel Type – Licensing Basis PCT: GNF2

Limiting Single Failure: Battery

Limiting Break Size and Location: Double-Ended Guillotine in a Recirculation Suction Pipe

Fuel Type:	GNF2
Reference PCT	1610 °F

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Peak Cladding Temperature Rack-up Sheet
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MARGIN ALLOCATION**A. PRIOR LOCA MODEL ASSESSMENTS**

	GNF2
2017-01: GNF2 Lower Tie Plate Leakage (see Assessment Note 2)	$\Delta\text{PCT} = -20^\circ\text{F}$
2017-02: Fuel Rod Plenum Temperature Update (see Assessment Note 2)	$\Delta\text{PCT} = 0^\circ\text{F}$
004N1122-R0: Summary of GEH AOO Transient and LOCA Analyses with Respect to ASD Modification in HCGS (see Assessment Note 2)	$\Delta\text{PCT} = 20^\circ\text{F}$
2019-05: SAFER Lower Limit on Differential Pressure for Bypass Leakage (see Assessment Note 2)	$\Delta\text{PCT} = 0^\circ\text{F}$
2020-01: PRIME Coding Errors for Zircaloy Irradiation Growth and Zr Barrier Thermal Conductivity as input to ECCS LOCA Analyses (see Assessment Note 2)	$\Delta\text{PCT} = 0^\circ\text{F}$
2021-01: Error in Fuel Pellet to Plenum Spring Conductance (see Assessment Note 2)	$\Delta\text{PCT} = 0^\circ\text{F}$
2021-02: Discrepancy in Inner Cladding Surface Roughness (see Assessment Note 2)	$\Delta\text{PCT} = 0^\circ\text{F}$
Net PCT	1610 °F

B. CURRENT LOCA MODEL ASSESSMENTS

	GNF2
None (See Assessment Note 3)	
Total PCT change from current assessments	$\sum \Delta\text{PCT} = 0^\circ\text{F}$
Cumulative PCT change for current assessments	$\sum \Delta\text{PCT} = 0^\circ\text{F}$
Net PCT	1610 °F

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Attachment 2
Hope Creek Generating Station 10 CFR 50.46 Report
Assessment Notes
(1 page)

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Assessment Notes
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1. Evaluation Model

The GESTR fuel rod thermal mechanical models described in Evaluation Model Reference 1 were replaced by the PRIME fuel rod thermal mechanical models described in Evaluation Model Reference 2.

2. Prior LOCA Model Assessments

Letter LR-N16-0234 reported the implementation of GNF2 and associated evaluation. All prior LOCA model assessments were incorporated, as applicable, in the licensing basis GNF2 evaluation.

Letter LR-N17-0141 reported the impact of Evaluation Model changes or errors associated with the modeling of GNF2 lower tie plate leakage and use of modern fuel rod design input for fuel rod plenum modeling.

Letter LR-N18-0099 reported the impact of the replacement of the recirculation system motor-generator sets with adjustable speed drives (ASD).

Letter LR-N20-0063 reported the impact of errors associated with the differential pressure lower limit for bypass leakage, Zircaloy irradiation growth, thermal conductivity of the Zr barrier, and gap conductance during pellet-cladding gap closure.

Letter LR-N21-0071 reported the impact of errors associated with the fuel pellet to plenum spring conductance value applied to calculations for the plenum region of the fuel rods, and an inconsistency in the inner cladding surface roughness used by the PRIME and SAFER models.

3. Current LOCA Model Assessments

No new assessments since last 10 CFR 50.46 Report transmitted in LR-N22-0075. Therefore, the GNF2 fuel type remains in compliance with the 50.46(b)(1) criterion that peak cladding temperature shall not exceed 2200 degrees F.