



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 18, 2021

Mr. Eric Carr
President and Chief Nuclear Officer
PSEG Nuclear LLC - N09
P.O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION – REQUEST FOR ADDITIONAL INFORMATION RE: LICENSE AMENDMENT REQUEST TO REVISE LOW PRESSURE SAFETY LIMIT TO ADDRESS GENERAL ELECTRIC PART 21 SAFETY COMMUNICATIONS (EPID L-2020-LLA-0210)

Dear Mr. Carr:

By letter dated September 24, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20272A063), PSEG Nuclear, LLC (the licensee) submitted a license amendment request to revise the Hope Creek Generating Station Technical Specification (TS) Safety Limit 2.1.1, "THERMAL POWER, Low Pressure or Low Flow," and 2.1.2, "THERMAL POWER, High Pressure and High Flow." The proposed change, which reduces the reactor steam dome low pressure safety limit specified in TS 2.1.1 and TS 2.1.2, will resolve an issue identified in General Electric Nuclear Energy Safety Communication notification SC05-03 pursuant to Title 10 of the *Code of Federal Regulations* Part 21. The issue is concerning a potential to momentarily violate TS 2.1.1 during a Pressure Regulator Failure Maximum Demand - Open transient event.

The U.S. Nuclear Regulatory Commission staff determined that additional information is required as discussed in Enclosure 1. The licensee has agreed to provide the RAI responses by April 30, 2021.

The request for additional information (RAI) contains proprietary information as originally submitted in the September 24, 2020, license amendment request. Proprietary information is identified by text enclosed within double brackets as shown here **[[]]**. A non-proprietary version of the RAI is provided in Enclosure 2.

Enclosure 1 transmitted herewith contains sensitive unclassified non-safeguards information. When separated from Enclosure 1, this letter is DECONTROLLED.

- 2 -

If you have any questions, please contact me at 301-415-4125 or via e-mail at James.Kim@nrc.gov.

Sincerely,

/RA/

James S. Kim, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures:

1. RAI (Proprietary)
2. RAI (Non-Proprietary)

cc without Enclosure 1: Listserv

ENCLOSURE 2

NON-PROPRIETARY VERSION

REQUEST FOR ADDITIONAL INFORMATION

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

LICENSE AMENDMENT REQUEST TO REVISE LOW PRESSURE SAFETY LIMIT TO

ADDRESS GENERAL ELECTRIC PART 21 SAFETY COMMUNICATIONS

DOCKET NO. 50-354

NON-PROPRIETARY VERSION

REQUEST FOR ADDITIONAL INFORMATION

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

LICENSE AMENDMENT REQUEST TO REVISE LOW PRESSURE SAFETY LIMIT TO

ADDRESS GENERAL ELECTRIC PART 21 SAFETY COMMUNICATIONS

DOCKET NO. 50-354

By application dated September 24, 2020 (Reference 1), PSEG Nuclear, LLC (PSEG, the licensee) submitted a license amendment request (LAR) to revise the Hope Creek Generating Station (HCGS) Technical Specification (TS) Safety Limit (SL) 2.1.1, "THERMAL POWER, Low Pressure or Low Flow," and 2.1.2, "THERMAL POWER, High Pressure and High Flow." The proposed change, which reduces the reactor steam dome low pressure safety limit specified in TS 2.1.1 and TS 2.1.2, will resolve an issue identified in a notification pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21. The issue is concerning a potential to momentarily violate TS 2.1.1 during a Pressure Regulator Failure Maximum Demand - Open (PRFO) transient event. The PRFO transient is analyzed in Chapter 15 of the HCGS Updated Final Safety Analysis Report.

After reviewing the LAR dated September 24, 2020, and Enclosure 6 (Reference 2) to the LAR, the U.S. Nuclear Regulatory Commission's (NRC) Nuclear Systems Performance Branch (SNSB) staff requests responses to the requests for additional information (RAIs) given below.

The proprietary information, pursuant to 10 CFR Section 2.390, in the RAIs is identified in red font text enclosed within double square brackets as shown here **[[example proprietary text]]**.

SNSB-RAI 1

Regulatory Basis:

Criterion 10 - Reactor Design: The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

RAI:

Reference 2, Section 2.0, Table 2-1, design input item 9 states the thermal power scram time constant is 6.6 seconds. Table 2-2, Item 2 states:

The simulated thermal power (STP) is an acceptable model of the core power. The thermal power time constant is provided in Design Input Item 9. The STP time constant used is **[[]]**.

Therefore, use of the STP time constant is conservative for the purpose of the PRFO analysis.

- (a) The classical definition of time constant for a specified parameter that decreases with time is that it represents the time taken for the parameter to decrease by a factor of $(1 - 1/e) =$ (approximately 0.632). Provide the definition of thermal power scram time constant used in the context of the above statement, the parameter for which the time constant is considered, and the fuel characteristics (or properties) on which it depends. The NRC staff searched through References 3, 4, and 5 and the GNF2 and GNF3 generic compliance documents NEDC-33270P, Revision 3 (Reference 6), and NEDC-33879P Revision 0 (Reference 7), and could not find the definition and values of the time constants for the GE14, GNF2, and GNF3 fuels to verify that the key input value of 6.6 seconds used for the PRFO analysis is conservative.
- (b) Describe the methods (test and/or codes) used to determine the thermal power scram time constant.
- (c) Provide the reference documents in which the time constant is defined and the values of GE14, GNF2, and GNF3 fuels are given, or provide definition and the actual values for these fuels. Explain **[[** **]]** is conservative.

SNSB RAI 2

Regulatory Basis:

Criterion 10 - Reactor Design: The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

RAI:

For the analysis to evaluate the performance of the GEXL14 and GEXL17 correlations against the GNF3 test data, Reference 2, Section 3.0 states:

[[

]]

(a) Explain why the [[

]]

(b) Explain what is meant by [[

]]

(c) Confirm that the [[

]] respectively. If not, provide the source of the [[
]]

(d) Based on the statement in Reference 5, Section 5.2.5, the additive constant applied to each fuel rod location [[

]]. Explain how this [[
]]

SNSB-RAI 3

Regulatory Basis:

Criterion 10 - Reactor Design: The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

RAI:

Reference 2, Section 3.1, states [[

]] Explain what is the significance and/or basis of [[]]

REFERENCES

1. PSEG Nuclear, LLC, letter to U.S. Nuclear Regulatory Commission, "License Amendment Request: Revise Hope Creek Generating Station Low Pressure Safety Limit to Address General Electric Nuclear Energy Part-21 Safety Communication SC05-03," dated September 24, 2020 (ADAMS Accession No. ML20272A063).
2. GE-Hitachi Nuclear Energy, NEDC-33928P, Revision 0, "SC05-03 Evaluation for Hope Creek Generating Station" (Proprietary), September 2020 (ADAMS Accession No. ML20272A064).
3. Global Nuclear Fuel, NEDC-32851P-A, Revision 5, "GEXL14 Correlation for GE14 Fuel," April 2011 (Proprietary) (ADAMS Accession No. ML111290535). Non-proprietary version designated as NEDO-32851-A, Revision 5, available at ADAMS Accession No. ML111290532.

4. Global Nuclear Fuel, NEDC-33292P, Revision 3, "GEXL17 Correlation for GNF2 Fuel," June 2009 (Proprietary) (ADAMS Accession No. ML091830641). Non-proprietary version designated as NEDO-33292, Revision 3, available at ADAMS Accession No. ML091830624.
5. Global Nuclear Fuel, NEDC-33880P, Revision 1, "GEXL21 Correlation for GNF3 Fuel," November 2017 (Proprietary) (ADAMS Accession No. ML17311A131). Non-proprietary version designated as NEDO-33880, Revision 1, available at ADAMS Accession No. ML17311A132.
6. Global Nuclear Fuel, NEDC-33270P, Revision 3, "GNF2 Advantage Generic Compliance with NEDE-24011-P-A (GESTAR II)," March 2010 (Proprietary) (ADAMS Accession No. ML100700462). Non-proprietary version designated as NEDO-33270, Revision 3, available at ADAMS Accession No. ML100700443.
7. Global Nuclear Fuel, NEDC-33879P, Revision 0, "GNF3 Generic Compliance with NEDE-24011-P-A (GESTAR II)," March 2017 (Proprietary) (ADAMS Accession No. ML17096A516). Non-proprietary version designated as NEDO-33879, Revision 0, available at ADAMS Accession No. ML17096A517.

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ADAMS Accession Nos.:
ML21041A345 (Proprietary)
ML21041A397 (Non-Proprietary)
ML21041A369 (Package)

OFFICE	NRR/DORL/LPL1/PM	NRR/DORL/LPL1/LA	NRR/DSS/SNSB/BC
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OFFICE	NRR/DORL/LPL1/BC	NRR/DORL/LPL2-1/PM	
NAME	JDanna	JKim	
DATE	02/18/2021	02/18/2021	

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