Enclosure 3 Contains Proprietary Information to be Withheld from
Public Disclosure Pursuant to 10 CFR 2.390

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10 CFR 50.90

LR-N21-0040
LAR H20-04

May 27, 2021

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: **Response to Request for Additional Information SNSB-RAI 1 Re: License Amendment Request to Revise Low Pressure Safety Limit to Address General Electric Part 21 Safety Communication (EPID L-2020-LLA-0210)**

References:
1. PSEG letter to NRC, "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. NRC letter to PSEG, "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), dated February 18, 2021, (ADAMS Accession No. ML21041A397)

3. PSEG letter to NRC, "Response to Requests for Additional Information SNSB-RAI 2 and SNSB-RAI 3 Re: License Amendment Request to Revise Low Pressure Safety Limit to Address General Electric Part 21 Safety Communication (EPID L-2020-LLA-0210)," dated April 29, 2021 (ADAMS Accession Nos. ML21119A367 and ML2119A368)

In the Reference 1 letter, PSEG Nuclear LLC (PSEG) submitted a license amendment request (LAR) for Hope Creek Generating Station (HCGS). The proposed amendment would revise HCGS Technical Specifications (TS) 2.1.1 to lower the Low Pressure Safety Limit to address General Electric (GE) Nuclear Energy Part 21 Safety Communication SC05-03.

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In the Reference 2 letter, the U.S. Nuclear Regulatory Commission staff provided PSEG a Request for Additional Information (RAI) to support the NRC staff's detailed technical review of Reference 1. The Reference 3 letter was a partial response to the RAI that addressed questions SNSB-RAI 2 and SNSB-RAI 3 contained in the Reference 2 letter. The enclosures to this letter contain the response to question SNSB-RAI 1 contained in the Reference 2 letter. The non-proprietary version of the response to question SNSB-RAI 1 is provided in Enclosure 1. Enclosure 2 contains an affidavit for withholding information executed by GE-Hitachi. The proprietary version of the response to question SNSB-RAI 1 is provided in Enclosure 3.

PSEG has determined that the information provided in this submittal does not alter the conclusions reached in the 10 CFR 50.92 no significant hazards determination previously submitted. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Mr. Michael Wiwel at 856-339-7907.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 27, 2021
(Date)

Respectfully,

Paul R. Duke, Jr.
Manager - Licensing
PSEG Nuclear LLC

Enclosure 1 SC05-03 Evaluation for Hope Creek Generating Station - Response to SNSB-RAI 1
Enclosure 2 Affidavit for withholding information executed by GE-Hitachi
Enclosure 3 Proprietary Version of SC05-03 Evaluation for Hope Creek Generating Station - Response to SNSB-RAI 1

cc: Administrator, Region I, NRC
NRC Project Manager
NRC Senior Resident Inspector, Hope Creek
Ms. A. Pfaff, Manager, NJBNE
PSEG Corporate Commitment Tracking Coordinator
Station Commitment Tracking Coordinator

LR-N21-0040

Enclosure 1

SC05-03 Evaluation for Hope Creek Generating Station – Response to SNSB-RAI-1

(Non-Proprietary Version)

Global Nuclear Fuel

Global Nuclear Fuel

006N6377-NP
Revision 1
May 2021

Non - Proprietary Information

SC05-03 Evaluation for Hope Creek Generating Station Response to SNSB RAI-1

INFORMATION NOTICE

This is a non-proprietary version of the document 006N6377-P, Revision 1, which has the proprietary information removed. Portions of the document that have been removed are indicated by open and closed brackets as shown here [[ ]].

IMPORTANT NOTICE REGARDING CONTENTS OF THIS REPORT PLEASE READ CAREFULLY

The only undertakings of GNF with respect to information in this document are contained in contracts between GNF-A and PSEG, and nothing contained in this document shall be construed as changing those contracts. The use of this information by anyone other than those participating entities and for any purposes other than those for which it is intended is not authorized; and with respect to any unauthorized use, GNF-A makes no representation or warranty, and assumes no liability as to the completeness, accuracy, or usefulness of the information contained in this document.

REVISION SUMMARY

Revision	Section	Revision Summary
0	-	Initial release.
1	Figure 1	Updated and added omitted note to Figure 1

NRC SNSB RAI 1:

Reference 2, [from NEDC-33928P] 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 [from NEDC-33928P] and the GNF2 and GNF3 generic compliance documents NEDC-33270P, Revision 3 [from RAI] Reference 6, and NEDC-33879P Revision 0 [from RAI] 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.

GNF Response (a)

The plant STP time constant is consistent with the classical time constant definition of the time taken for the parameter to decrease by a factor of (1 – 1/e). The parameter in the case of the STP time constant is the fuel surface heat flux. As such the STP time constant is a representation of the relationship (i.e., time delay) between the neutron flux response and the fuel surface heat flux response. The time constant is used in the Pressure Regulator Failure – Open (PRFO) analysis to provide a conservative approximation of the fuel surface heat flux based upon the neutron flux measured by the Average Power Range Monitors (APRMs) (see Response (c) for further detail).

The plant STP time constant is one of the parameters that is supplied each cycle by the plant in the reload design input document referred to as the OPL-3. The design guide for the OPL-3 inputs states that GE's position on the STP time constant as it relates to fuel design changes is as follows:

1) The time constant is part of the instrumentation (not a core characteristic),
2) Its purpose is to avoid spurious trips due to minor flux spikes and challenges to the RPS,
3) The value used only approximates the fuel heat flux response, as the true time constant is different for old/new fuel (e.g. different gap conductance and fuel temperature).
4) The most important thing is that any Licensing Analyses use the plant design value, and not that it be exact or bounding with respect to the fuel in the core.

Therefore, in conclusion, no change to the STP time constant is required nor desirable when new fuel designs are implemented.

In this instance instrumentation is referring to the APRMs, RPS is referring to the Reactor Protection System, and "spurious trips due to minor flux spikes" is referring to spurious reactor scrams due to momentary spikes in neutron flux. The 6.6 second value was provided by Hope Creek in the latest OPL-3 document as the maximum plant design value for the simulated thermal power function of the APRM instrumentation. The conservatism of the time constant used for the PRFO analysis is confirmed by comparing the actual fuel surface heat flux calculated by TRACG to the approximated fuel surface heat flux calculated using the STP time constant, as described in the response to Part (c) of this RAI.

(b) Describe the methods (test and/or codes) used to determine the thermal power scram time constant.

GNF Response (b)

There are no methods utilized for determining the simulated thermal power time constant. As noted in the response to Part (a), the simulated thermal power time constant is an APRM instrumentation parameter with the intended purpose to avoid spurious reactor scrams due to momentary spikes in neutron flux.

(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.

GNF Response (c)

As noted in the response to (a) and (b) above, the simulated thermal power time constant is part of the plant instrumentation. As such, a value isn't developed for specific fuel designs. To demonstrate that the time constant value utilized for the PRFO analysis is conservative in predicting the fuel surface heat flux, a representative case from the report was chosen to compare the actual fuel surface heat flux calculated by TRACG to the approximate fuel surface heat flux calculated using the simulated thermal power time constant. As can be seen in Figure 1 below, for a representative 65% initial power PRFO case, the calculated actual fuel surface heat flux decreases faster than the approximated fuel surface heat flux using the simulated thermal power time constant. This demonstrates that the actual fuel time constant is [[ ]] Choosing a higher value for the time constant results in the fuel surface heat flux [[ ]] that would be experienced during a PRFO event. Additional time constants of 7.0 to 6.0 seconds were run and plotted in Figure 1 to demonstrate the sensitivity of the fuel surface heat flux decrease to the simulated thermal power time constant.

Figure 1
65% Initial Power PRFO Case

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*All Y axis values have been normalized to their initial values for the 65% power case plotted here.

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Enclosure 2

Affidavit from GEH Supporting the Withholding of Information in Enclosure 3 From Public Disclosure

Global Nuclear Fuel – Americas, LLC

AFFIDAVIT

I, **Brian R. Moore,** state as follows:

(1) I am General Manager, Core & Fuel Engineering, Global Nuclear Fuel – Americas, LLC (GNF-A), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in GEH proprietary report 006N6377P, "SC05-03 Evaluation for Hope Creek Generating Station, Response to SNSB-RAI 1" Revision 1, dated May 2021. GEH proprietary information in 006N6377P Revision 1 is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]]. GEH proprietary information in figures and large objects is identified by double square brackets before and after the object. In each case, the superscript notation {3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, GEH relies upon the exemption from disclosure set forth in the *Freedom of Information Act* ("FOIA"), 5 U.S.C. §552(b)(4), and the *Trade Secrets Act*, 18 U.S.C. §1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.390(a)(4) for trade secrets (Exemption 4). The material for which exemption from disclosure is here sought also qualifies under the narrower definition of trade secret, within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975 F.2d 871 (D.C. Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F.2d 1280 (D.C. Cir. 1983).

(4) The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a and (4)b. Some examples of categories of information that fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GEH's competitors without a license from GEH constitutes a competitive economic advantage over other companies;

b. Information that, if used by a competitor, would reduce its expenditure of resources or improve its competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, resulting in potential products to GEH;

d. Information that discloses trade secret or potentially patentable subject matter for which it may be desirable to obtain patent protection.

(5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GEH, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GEH, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions for proprietary or confidentiality agreements or both that provide for maintaining the information in confidence. The initial designation of this information as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in the following paragraphs (6) and (7).

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist, or other equivalent authority for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GEH are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary and/or confidentiality agreements.

(8) The information identified in paragraph (2) is classified as proprietary because it contains the detailed GEH methodology for analyzing and applying simulated thermal power time constants for the GEH Boiling Water Reactor (BWR). These methods, techniques, and data along with their application to the design, modification and analyses requirements were achieved at a significant cost to GEH.

The development of the evaluation processes along with the interpretation and application of the analytical results is derived from the extensive experience databases that constitute a major GEH asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GEH's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GEH's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GEH. The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial. GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GEH would be lost if the information were disclosed to the public. Making such information available to competitors without there having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall and deprive GEH of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing is true and

correct. Executed on this 26th day of May 2021.

Brian R. Moore
General Manager, Core & Fuel Engineering
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