

August 10, 2017

Mr. Jerald G. Head
Senior Vice President, Regulatory Affairs
General Electric-Hitachi
Nuclear Energy Americas, LLC
P.O. Box 780, M/C A-18
Wilmington, NC 28401-0780

SUBJECT: FINAL SAFETY EVALUATION FOR GLOBAL NUCLEAR FUEL - AMERICAS, LLC, PROPOSED AMENDMENT 45 TO NEDE-24011-P-A-24, "GENERAL ELECTRIC STANDARD APPLICATION FOR REACTOR FUEL (GESTARII) TO CLARIFY THE APPLICATION OF GESTARII TO PLANTS THAT HAVE SPECIFIC APPROVAL TO OPERATE AT GREATER THAN 120% OLTP IN THE MELLLA+DOMAIN (CAC NO. MF9621)

Dear Mr. Head:

By letter dated April 23, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17103A372), Global Nuclear Fuel – Americas, LLC (GNF) submitted "Proposed Amendment 45 to NEDE-24011-P-A-24, "General Electric Standard Application for Reactor Fuel (GESTARII) to Clarify the Application of GESTARII to Plants that Have Specific Approval to Operate at Greater Than 120% OLTP in the MELLLA+ Domain," to the U.S. Nuclear Regulatory Commission (NRC) staff for review.

By letter dated July 26, 2017, an NRC draft safety evaluation (SE) regarding our approval of "Proposed Amendment 45 to NEDE-24011-P-A-24, "General Electric Standard Application for Reactor Fuel (GESTARII) to Clarify the Application of GESTARII to Plants that Have Specific Approval to Operate at Greater Than 120% OLTP in the MELLLA+ Domain," was provided for your review and comment (ADAMS Accession No. ML17172A010). By letter dated August 1, 2017, you stated that you did not identify any proprietary information, factual errors, or clarity concerns in the draft SE (ADAMS Accession No. ML17213A206).

The NRC staff has found that Proposed Amendment 45 to NEDE-24011-P-A-24 is acceptable for referencing in licensing applications for nuclear power plants to the extent specified and under the limitations delineated in the TR and in the enclosed final SE. The final SE defines the basis for our acceptance of the TR.

Our acceptance applies only to material provided in the subject TR. We do not intend to repeat our review of the acceptable material described in the TR. When the TR appears as a reference in licensing applications, our review will ensure that the material presented applies to the specific plant involved. License amendment requests that deviate from this TR will be subject to a plant-specific review in accordance with applicable review standards.

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In accordance with the guidance provided on the NRC website, we request that GNF publish the approved Amendment 45 to NEDE-24011-P-A-24, within three months of receipt of this letter. The approved version shall incorporate this letter and the enclosed final SE after the title page. The approved versions shall include a "-A" (designating approved) following the TR identification symbol.

If future changes to the NRC's regulatory requirements affect the acceptability of this TR, GNF will be expected to revise the TR appropriately or justify its continued applicability for subsequent referencing. Licensees referencing this TR would be expected to justify its continued applicability or evaluate their plant using the revised TR.

Sincerely,

/RA/

Dennis C. Morey, Chief
Licensing Processes Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 712

Enclosure:
Final SE

SUBJECT: FINAL SAFETY EVALUATION FOR GLOBAL NUCLEAR FUEL - AMERICAS, LLC, PROPOSED AMENDMENT 45 TO NEDE-24011-P-A-24, "GENERAL ELECTRIC STANDARD APPLICATION FOR REACTOR FUEL (GESTARII) TO CLARIFY THE APPLICATION OF GESTARII TO PLANTS THAT HAVE SPECIFIC APPROVAL TO OPERATE AT GREATER THAN 120% OLTP IN THE MELLA+DOMAIN (CAC NO. MF9621)
DATED: AUGUST 10, 2017

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ADAMS Accession No.: ML17214A037; *concurrence via e-mail

NRR-106

OFFICE	NRR/DPR/PLPB/PM	NRR/DPRPLPB/LA*	NRR/DSS/SNPB/BC	NRR/DPR/PLPB/BC
NAME	JGolla	DHarrison	(RAnzalone for) RLukes	DMorey
DATE	8/8/17	8/4/17	8/8/17	8/10/17

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GE-Hitachi Nuclear Energy Americas

Project No. 712

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OFFICE OF NUCLEAR REACTOR REGULATION DIVISION OF SAFETY SYSTEMS

FINAL SAFETY EVALUATION FOR AMENDMENT 45 TO GLOBAL

NUCLEAR FUEL – AMERICAS TOPICAL REPORT NEDE-24011- P-A-24

GENERAL ELECTRIC STANDARD APPLICATION FOR REACTOR FUEL (GESTAR II)

TO CLARIFY THE APPLICATION OF GESTAR II TO PLANTS THAT HAVE

SPECIFIC APPROVAL TO OPERATE AT GREATER THAN 120% OLTP

IN THE MELLA+ DOMAIN

(CAC NO. MF9621)

1.0 INTRODUCTION AND BACKGROUND

By letter dated April 13, 2017, Global Nuclear Fuel – Americas, LLC (GNF) submitted proposed Amendment 45 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17103A372) to Topical Report (TR) NEDE-24011-P-A-24, General Electric Standard Application for Reactor Fuel (GESTAR II, U. S. Supplement) to the U. S. Nuclear Regulatory Commission (NRC) staff for review (Ref. 1).

In Amendment 45, GNF requests to amend GESTAR II to clarify the application of GESTAR II to plants that have specific approval to operate at greater than 120 percent original licensed thermal power (OLTP) in the maximum extended load line limit analysis plus (MELLA+) domain. In addition to editorial changes in the GESTAR US Supplement, Section S.5.2.13, which is edited to clarify that specific plants may be approved to operate with a licensed thermal power greater than 120 percent OLTP, the amendment requests the addition of Reference S-67 of the topical report (TR), *Generic Guidelines and Evaluations for General Electric Boiling Water Reactor Thermal Power Optimization*, NEDC-32938P-A, Revision 2 (Ref. 2)

2.0 REGULATORY EVALUATION

Not Applicable in this case

3.0 TECHNICAL EVALUATION

3.1 Introduction

Topical Report (TR) NEDC-32938P-A presents generic guidelines, evaluations, criteria, and scope of work as required by the NRC for licensee applications to increase the licensed thermal power levels of General Electric (GE) Boiling Water Reactor (BWR) plants. The power level increase is the result of implementation of reduced power uncertainty obtained as a result of evaluations and analyses. This TR describes thermal power optimization (TPO) which covers an increase up to 1.5 percent or slightly above 1.5 percent of the current licensed thermal power (CLTP) consistent with the magnitude of a thermal power uncertainty reduction. The magnitude of the plant-specific thermal power uncertainty reduction is dependent on several factors,

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including the design and accuracy of the plant feedwater (FW) flow measurement instrumentation.

The TPO TR guidelines require a core thermal hydraulic design and fuel performance characteristics evaluation for each reload cycle. Section 5 of the TR SE addresses the effect of a TPO uprate on fuel design performance limits, thermal limits, the power/flow map, and stability.

3.2 Applicability of TPO TR NEDC-32938P-A for Upgrades Greater than 1.5 Percent (greater than 120 Percent OLTP)

Section 4.1 of the SE for NEDC-32938P-A, Revision 2, and Section 4.2.1 of the TPO TR discusses the situation where it is anticipated that the achievable thermal power uncertainty could be equal to or greater than 0.5 percent. This means that the TPO power uprate can be greater than 1.5 percent. A plant-specific application could request a TPO uprate greater than 1.5 percent depending on the plant-specific FW measurement uncertainty.

In Section 4.2.1 of the TPO TR, GE has stated that any plant specific TPO uprate submittal based on power level uncertainty of less than 0.5 percent will have to provide justification for the use of the generic TPO TR. Plants seeking a TPO uprate that would result in a CLTP in excess of 120 percent of OLTP are required to provide plant-specific evaluations for those plants for which TPO uprate evaluations were not performed at 102 percent of licensed thermal power. A thermal power increase greater than 120 percent of the OLTP occurs after plant-specific evaluations were performed using current licensing bases which includes approved amendments for extended power uprate (EPU) and MELLLA+, as per approved TRs (Refs. 3, 4, and 5 for EPU and Ref. 6 for MELLLA+).

The NRC staff has determined that for BWR plants that had implemented the EPU and have the MELLLA+ operating domain included in the analysis and licensing basis, these plants may be licensed for operation at greater than 120 percent of OLTP based on the provisions of the approved TPO TR (Ref. 2).

4.0 **CONCLUSION**

The NRC staff has reviewed the request for Amendment 45 to GESTAR II to clarify the application of GESTAR II to plants that have specific approval to operate at greater than 120 percent OLTP in the MELLLA+ operating domain. The NRC staff has determined that those BWR plants that have implemented EPU and are operating in the MELLLA+ domain may be approved for operation at greater than 120% OLTP. Therefore the requested Amendment 45 to GESTAR II is approved.

Also the staff approves the inclusion of the approved TR, NEDC-32938P-A, Revision 2, to the list of References listed in NEDO-24011-A US Supplement identified as Reference Number S-67.

5.0 REFERENCES

1. Letter, M170089 from Brian Moore (GNF- A) to US NRC, Proposed Amendment 45 to NEDE-24011-P-A-24, General Electric Standard Application for Reactor Fuel (GESTAR II) to Clarify the Application of GESTAR II to Plants that Have Specific Approval to Operate at Greater Than 120% OLTP in the MELLLA+ Domain,” Global Nuclear Fuel – Americas, LLC, April 13, 2017 (ADAMS Accession No. ML17103A372).
2. NEDC-32938P-A, Revision 2, “Generic Guidelines and Evaluations for General Electric Boiling Water Reactor Thermal Power Optimization,” Global Nuclear Fuels, May 2003.
3. GE Nuclear Energy, “Generic Guidelines for General Electric Boiling Water Reactor Extended Power Uprate,” (ELTR1), NEDC-32424P-A, February 1999; and NEDO-32424, April 1995.
4. GE Nuclear Energy, “Generic Evaluations of General Electric Boiling Water Reactor Extended Power Uprate,” (ELTR2), NEDC-32523P-A, February 2000; NEDC-32523P-A, Supplement 1 Volume I, February 1999; and Supplement 1 Volume II, April 1999.
5. GE Nuclear Energy, “Constant Pressure Power Uprate,” NEDC-33004P-A, Revision 4, June 2003.
6. GE Hitachi Nuclear Energy, “General Electric Boiling Water Reactor Maximum Extended Load Line Limit Analysis Plus,” NEDC-33006P-A, Revision 3, June 2009.

Principal Contributor: Mathew M. Panicker

Date: August 10, 2017