

April 23, 2015

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

SUBJECT: FINAL SAFETY EVALUATION FOR AMENDMENT 36 TO GLOBAL NUCLEAR  
FUEL – AMERICAS TOPICAL REPORT NEDE-24011-P-A, GENERAL  
ELECTRIC STANDARD APPLICATION FOR REACTOR FUEL (GESTAR II)  
(TAC NO. MF3404)

Dear Mr. Head:

By letters dated October 4 and November 9, 2012, and March 19, 2013, Global Nuclear Fuel – Americas, LLC (GNF) submitted Amendment 36 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12278A397, ML123140397, and ML130790238, respectively) to Topical Report (TR) NEDE-24011-P-A, “General Electric Standard Application for Reactor Fuel (GESTAR II, U. S. Supplement),” to the U.S. Nuclear Regulatory Commission (NRC) staff for review. The changes proposed in the Amendment 36 are administrative in nature (References 1, 2, and 3).

The NRC staff has found that Amendment 36 to GESTAR II is acceptable for referencing in licensing applications for General Electric-designed boiling water reactors to the extent specified in the enclosed final safety evaluation (SE). The final SE defines the basis for 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 applicable material described in the TR. When the TR appears as a reference in license 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.

The accepted versions shall incorporate this letter and the enclosed final SE after the title page. Also, they must contain historical review information, including NRC requests for additional information and your responses. The accepted versions shall include a “-A” (designating accepted) following the TR identification symbol.

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If future changes to the NRC's regulatory requirements affect the acceptability of this TR, GNF and/or licensees referencing it will be expected to revise the TR appropriately, or justify its continued applicability for subsequent referencing.

Sincerely,

**/RA/**

Mirela Gavrilas, Deputy Director  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Project No. 710

Enclosure:  
Final Safety Evaluation

cc w/encl: See next page

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**ADAMS Accession No.: ML15077A419**

**NRR-106**

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**SAFETY EVALUATION FOR AMENDMENT 36**  
**TO GLOBAL NUCLEAR FUEL – AMERICAS LLC**  
**TOPICAL REPORT NEDE-24011-P-A-US, GENERAL ELECTRIC**  
**STANDARD APPLICATION FOR REACTOR FUEL (TAC NO. MF3404)**

**1.0 INTRODUCTION AND BACKGROUND**

By letters dated October 4 and November 9, 2012, and March 19, 2013, Global Nuclear Fuel – Americas, LLC (GNF) submitted Amendment 36 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12278A397, ML123140397, and ML130790238, respectively) to Topical Report (TR) NEDE-24011-P-A, General Electric Standard Application for Reactor Fuel (GESTAR II, U. S. Supplement), to the U.S. Nuclear Regulatory Commission (NRC) staff for review. The changes proposed in the Amendment 36 are administrative in nature (References 1, 2, and 3).

In the October 4, 2012, letter, GNF requests addition of recently approved Licensing TR (LTR), *Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications, NEDO-32465-A*, Supplement 1P-A (Reference 4) to the existing methodology reference, S-85 in GESTAR II (NEDE-20411-P-A-US).

In addition, the Amendment 36 seeks to correct an error that occurred during the preparation of GESTAR II Revision 18 (Reference 3), a version of the GESTAR II Amendment 34 Safety Evaluation (SE) that was inadvertently included in the US Supplement which did not include the date of issuance. The amendment seeks to correct the error by replacing the Amendment 34 SE from the (ADAMS Accession No. ML111010231).

In the November 9, 2012, request, GNF proposes to add the LTRs, *Implementation of PRIME Models and Data in Downstream Methods, NEDO-33173 Supplement 4-A* (Reference 5) and *Applicability of GE Methods to Expanded Operating Domains, NEDC-33173P-A* (Reference 6) to GESTAR II.

In the March 19, 2013, request, GNF proposed to add the LTR, *NEDC-33075 Revision 7, General electric Boiling Water Reactor Detect and Suppress Solution – Confirmation Density*” (Reference 7) to GESTAR II US supplement.

**2.0 EVALUATION**

**2.1 Reference Addition of NEDE-32465 Supplement 1-A in GESTAR II**

The NRC staff approved the TR NEDO-32465, Supplement 1, “Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications” (Reference 1). NEDO-32465, Supplement 1-A, provides the licensing basis and methodology for Delta Critical Power Ratio (CPR) over Initial Minimum Critical Power Ratio (MCPR) Versus Oscillation Magnitude (DIVOM) calculations using the TRACG04 and PANAC11 codes.

ENCLOSURE

GNF requests this approved TR be incorporated into the existing methodology reference, S-85, in GESTAR II (NEDE-24011-P-A-US). The reference shall be as follows:

*S-85 Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications, NEDO-32645-A, August 1996 and Migration to TRACG04/PANAC11 from TRACG02/PANAC10 for Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications, NEDO-32645, Supplement 1-A, October 2014.*

The NRC staff agrees that updating this reference is an administrative change, and, therefore finds it acceptable.

## 2.2 Correction of date of issuance of GESTAR II Amendment 34 SE

GESTAR II Revision 18 (Reference 3) includes an Amendment 34 to GESTAR II SE which did not have a date of issuance. GNF requests to correct this error by replacing the erroneous SE with the Amendment 34 SE (ADAMS Accession No. ML111010231). The NRC staff reviewed this request and agrees that this administrative change is acceptable.

## 2.3 Incorporation of NEDO-33173 Supplement 4-A and NEDC-33173P into GESTAR II

The TR, NEDO-33173 Supplement 4-A, Revision 1 was approved November 12, 2012, and the NRC staff has determined that the PRIME models had been correctly implemented in accordance with the approved process described in NEDO-33173 Supplement 4. Therefore, this approved TR shall be incorporated in to the GESTAR II document as Reference 2-21:

*2.21 Implementation of PRIME Models and Data in Downstream Methods, NEDO-33173 Supplement 4-A, Revision 1, November 2012.*

This approved TR can be added to the reference section of GESTAR II for US applications as:

*S-101 Applicability of GE Methods to Expanded Operating Domains, Licensing Topical Report, NEDC-33173P-A, Revision 4, Class III, November 2012.*

*S-110 Implementation of PRIME Models and Data in Downstream Methods, NEDO-33173 Supplement 4-A, Revision 1, November 2012.*

The NRC staff has determined that updating this reference is an administrative change and, therefore, finds it acceptable.

## 2.4 Addition of NEDE-33075 Revision 7 to GESTAR II Document

Topical Report, NEDC-33075P was approved and the accepted version was received by the NRC as Revision 7 (Reference 9). However, due to several changes to the TR as a result of responses to request for additional information, the accepted version of the TR was marked as Revision 8 (Reference 7).

GEH has made several changes in Sections S.1.3, S.4, S.4.1.5, S.4.2.3, S.4.2.4, S.5.2.4, and S.6 of the US supplement to GESTAR II in the Amendment 36. These changes are mostly editorial

and administrative changes except in S.4.2.4, *Backup Stability Protection (BSP) for DSS-CD per Reference S-111*. In Amendment 36, GEH requests to add a reference (S-111) in Section S.6 of GESTAR II document:

*S-111 GE Hitachi Boiling Water Reactor Detect and Suppress Solution – Confirmation Density, NEDC-33075P-A, Revision 7, November 19, 2013.*

Section S.4.2.4 describes that BSP for DSS-CD is a backup solution based on exclusion regions in case the DSS-CD solution is not operational. Also section S.4.2.4 discusses the differences between the BSP for DSS-CD implemented per Revision 7 and the BSP for DSS-CD implemented per Revision 6 of NEDC-33075 during the implementation at BWR plants. The NRC staff has verified the validity of the addition to the Section S.4.2.4 and found acceptable since the additions are in accordance with the accepted version of NEDC-33075 and its accompanying staff's SE.

The NRC staff has found the changes to GESTAR II as documented in Sections 2.1, 2.2, 2.3, and 2.4 of this SE acceptable.

### **3.0 CONCLUSION**

Based on the review and evaluation of GNF request for Amendment 36 to GESTAR II, the NRC staff finds that the proposed changes in Amendment 36 to NEDE-24011-A are administrative in nature and, therefore, are acceptable.

### **4.0 REFERENCES**

1. Letter, MFN 12-112 from Andrew Lingenfelter (GNF) to the U.S. Nuclear Regulatory Commission, "Administrative Amendment 36 to GESTAR II to Implement Referencing of NEDO-32465 Supplement 1-A," Global Nuclear Fuel, October 4, 2012.
2. Letter MFN 12-112 Sup 1, from Andrew Lingenfelter to the U.S. Nuclear Regulatory Commission, "Supplement to Administrative Amendment 36 to GESTAR II to Update the NEDO-33173 Supplement 4-A and NEDC-33173P-A References," Global Nuclear Fuel, November 9, 2012.
3. Letter MFN 12-112 Sup 2 from Andrew Lingenfelter to the U.S. Nuclear Regulatory Commission, "Supplement to Administrative Amendment 36 to GESTAR II to Incorporate Revision 7 of the DSS-CD LTR into GESTAR II US Supplement," Global Nuclear Fuel, March 19, 2013.
4. NEDE-32465 (NEDO-32465) Supplement 1P-A, Revision 1, Licensing Topical Report Supplement, "Migration to TRACG04/PANACC11 from TRACG02/PANAC10 for Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications," GE Hitachi Nuclear Energy, October 2014.
5. NEDO-33173, Supplement 4-A, Revision 1, "Implementation of PRIME Models and Data in Downstream Methods (MFN-12-117)," GE Hitachi, November 2, 2012.
6. MFN-12-124, "Incorporation of Supplement 4 PRIME Implementation Audit Approval in to NEDC-33173P-A, Revision 4, GEH, November 7, 2012.
7. NEDC-33075P-A, Revision 8 (Revision 7), "GE Hitachi Boiling Water Reactor Detect and Suppress Solution – Confirmation Density," GEH, November 2013.

8. NEDE-24011-P-A, Revision 18, General Electric Standard Application for Reactor Fuel (GESTAR II, US Supplement), Global Nuclear Fuel, April 2011.
9. Letter MFN 13-081 from James Harrison (GEH) to the U.S. Nuclear Regulatory Commission, "Accepted Version of NEDC-33075P Revision 7, "GE Hitachi Boiling Water Reactor Detect and Suppress Solution – Confirmation Density," GEH Nuclear Energy, November 19, 2013.

Principal Contributor: M. Panicker

Date: April 23, 2015