

April 6, 2004

Ms. Margaret Harding, Manager
Fuel Engineering Services
Global Nuclear Fuel
P.O. Box 780
Wilmington, NC 28402

SUBJECT: DRAFT SAFETY EVALUATION FOR AMENDMENT 27 TO LICENSING
TOPICAL REPORT (LTR) NEDE-24011-P-A, "GESTAR II" (TAC NO. MC0347)

Dear Ms. Harding:

By letter dated August 6, 2003, Global Nuclear Fuel (GNF) submitted Amendment 27 to LTR NEDE-24011-P-A, "GESTAR" as a standard amendment to the staff for review. The letter dated March 15, 2004, supplemented the August 6, 2003, letter, to identify the administrative changes involved in Amendment 27 to GESTAR II. Enclosed for GNF's review and comment is a copy of the staff's draft safety evaluation (SE) that addresses the administrative changes.

Pursuant to Section 2.390 of Title 10 of the *Code of Federal Regulations* (10 CFR), we have determined that the enclosed draft SE does not contain proprietary information. However, we will delay placing the draft SE in the public document room for a period of ten working days from the date of this letter to provide you with the opportunity to comment on the proprietary aspects. If you believe that any information in the enclosure is proprietary, please identify such information line-by-line and define the basis pursuant to the criteria of 10 CFR 2.390. After ten working days, the draft SE will be made publicly available, and an additional ten working days are provided to you to comment on any factual errors or clarity concerns contained in the SE. The final SE will be issued after making any necessary changes and will be made publicly available. The staff's disposition of your comments on the draft SE will be discussed in the final SE.

To facilitate the staff's review of your comments, please provide a marked-up copy of the draft SE showing proposed changes. Number the lines in the marked-up SE sequentially and provide a summary table of the proposed changes.

If you have any questions, please contact Alan Wang at (301) 415-1445.

Sincerely,

/RA by M. Fields for/
Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 712

Enclosure: Draft Safety Evaluation

cc w/encl: See next page

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Global Nuclear Fuel

Project No. 712

cc:

Mr. Charles M. Vaughan, Manager
Facility Licensing
Global Nuclear Fuel - Americas
P.O. Box 780
Wilmington, NC 28402

Mr. George B. Stramback
Regulatory Services Project Manager
GE Nuclear Energy
175 Curtner Avenue
San Jose, CA 95125

Mr. James F. Klapproth, Manager
Engineering & Technology
GE Nuclear Energy
175 Curtner Avenue
San Jose, CA 95125

Mr. Glen A. Watford, Manager
Technical Services
GE Nuclear Energy
175 Curtner Avenue
San Jose, CA 95125

DRAFT SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

AMENDMENT 27 TO TOPICAL REPORT NEDE-24011-P-A, "GESTAR II"

GLOBAL NUCLEAR FUEL

PROJECT NO. 712

1.0 INTRODUCTION

By letter dated August 6, 2003, Global Nuclear Fuel (GNF) submitted a request for review of Amendment 27 to GESTAR II as a standard amendment. The August 6, 2003, submittal was supported by a meeting with the staff on December 2, 2003, and supplemented by a letter dated March 15, 2004. The meeting on December 2, 2003, and the March 15, 2004, letter supplemented the letter dated August 6, 2003, to identify the administrative changes involved in Amendment 27 to GESTAR II. These changes included updated revision references, typographical errors and deletions, and addition of new approved codes. This safety evaluation addresses the administrative changes noted in the March 15, 2004, letter.

2.0 BACKGROUND AND DISCUSSION

In a meeting with GNF on December 2, 2003, GNF identified those changes in Amendment 27 which it felt were administrative in nature. By letter dated March 15, 2004, GNF requested that the administrative changes in Amendment 27 be reviewed first to allow plants with Spring outages to take advantage of latter revisions and newly approved codes. The remainder of the Amendment 27 changes will be approved consistent with the schedule provided in our October 1, 2003, acceptance letter.

3.0 EVALUATION

The staff has evaluated each of the proposed changes below. A table with a summary of the changes and descriptions is attached.

Update of Reference NEDE-31152-P

This change updates the various sections of GESTAR II to reflect the latest revision of NEDE-31152-P, "General Electric Fuel Bundle Design," to Revision 8 from Revision 7. The staff agrees that these changes are administrative changes and are therefore acceptable.

ODYSY Licensing Topical Report

This change updates the various sections of GESTAR II to reflect the NRC approval of NEDC-32992P-A, "ODYSY, Application for Stability Licensing Calculations," July 2001. Prior to approval of ODYSY the core and channel decay ratios for fuel designs were calculated using identical operating state conditions for power, flow, inlet subcooling, axial and radial core power shaped, and core pressure. In accordance with the ODYSY procedure, the axial and radial core power shapes will now correspond to the actual operating conditions at these steady state points. The staff has previously reviewed and approved the use of this licensing topical report (LTR). The addition of references to ODYSY are administrative changes and are therefore acceptable to the staff.

Correction of Maximum Linear Heat Generation Rate (MLHGR) to Linear Heat Generation Rate (LHGR)

This change corrects an error made in nomenclature. The correct term should have been LHGR limit and not MLHGR. The staff agrees that the correct term is LHGR limit. The change is an administrative change and therefore is acceptable to the staff.

Update LTRs to Correct Revision and Date Not Previously Corrected

This change updates reference sections 2.4, 3.6, and 4.4 to reflect the latest revisions used for various codes. These changes are for revisions that were made in previous amendments to GESTAR II, but the references were not updated. The staff agrees that these changes are administrative changes and therefore are acceptable to the staff.

Add Three References to Section 3.2.2.2, "Power Distribution Accuracy"

This change adds three references to Section 3.2.2.2. One of the references added currently exists and two new references were added. The two new references are NEDC-32601P-A, "Methodology and Uncertainties for Safety Limit MCPR Evaluation" and NEDC-32694P-A, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations." These LTRs have been reviewed and approved by staff. The staff agrees that adding these references is an administrative change and therefore is acceptable to the staff.

Delete Doppler/Void Coefficient Requirements from Section 3.2.3.1

This change removes the requirement for Doppler and void coefficients, which are used in the REDY code, to be provided in the Final Safety Analysis Report (FSAR) or in the Supplemental Reload Licensing Report (SRLR). The REDY code has been replaced by the NRC-approved ODYN code (and TRACG), in which these two coefficients are no longer directly inputted. Therefore, these values no longer need to be provided in the FSAR or the SRLR. Therefore, the removal of this requirement is administrative as these coefficients are not used. The staff agrees that the removal of this requirement is an administrative change and therefore is acceptable to the staff.

MLHGR Versus LHGR With PANAC11

In Table 3-1, "Definition of Fuel Design Limits," item (b) "all fuel design limits" has been revised to "all fuel rod thermal mechanical design limits" and "MLHGR" was revised to "exposure-dependent MLHGR." These changes were made to clarify these two options identified in Amendment 19 to GESTAR II. There has been no change to the content. The staff agrees that these changes clarify the existing options and does not change their intent and therefore are acceptable to the staff.

Adds TRACG, ODYN, and TASC References to Section 4.3.1.2

This change adds NEDE-32906P-A, Revision 1, "TRACG Application for Anticipated Operational Occurrences Transient Analysis," as an approved transient analysis method for application to anticipated operational occurrence (AOO) transients. TRACG for AOOs was previously reviewed and approved by the staff in NEDE-32906P-A, Revision 1 and has been incorporated into Amendment 27 of GESTAR II (Sections 4.3.1.2.1, 2, 5 and 6, 4.4, S2.2.2.1.1, 2, 3, 4, 6, and 7, S.5.1, S.5.1.5 and Appendix B [page 36]). As with any approved methodology, the use of TRACG is subject to the conditions and limitations outlined in its safety evaluation. It also adds the latest approval of NEDC-24154P-A, "Qualification of the One-Dimensional Core Transient Model (ODYN) for Boiling Water Reactors" (Supplement 1 -Volume 4), and NEDC-32084P-A, Revision 2, "TASC-03A-A Computer Program for Transient Analysis of a Single Channel." These LTRs have been previously reviewed and approved. The staff agrees that adding these references is an administrative change and therefore is acceptable to the staff.

Add ODYN to Section 4.3.1.2.2

This change allows ODYN to be used in AOO slow events. This is the same as the change described above for Section 4.3.1.2. This LTR has been previously reviewed and approved. The staff agrees that adding this reference is an administrative change and therefore is acceptable to the staff.

Add TASC-03A to Section 4.3.1.2.5

This change allows TASC to be used in AOO rapid events. This is the same as the change described above for Section 4.3.1.2. This topical report has been previously reviewed and approved. The staff agrees that adding this reference is an administrative change and therefore is acceptable to the staff.

Delete Tables S-6, S-7, and S-8

This change deletes three tables that are no longer being used. These tables were marked as not being used. Since these tables are not being used, the staff agrees that they can be deleted. The staff agrees that deleting these tables is an administrative change and therefore is acceptable to the staff.

Add References to SAFER/GESTR and Upper Bound PCT to Sections S2.2.3.2.4 and S.2.2.3.2.4.1

This change adds NEDC-32950P, "Compilation of Improvements to GENE's SAFER ECCS-LOCA Evaluation Model" and NEDC-23785P-A, Supplement 1, Revision 1, "GESTAR-LOCA and SAFER Models for Evaluation of Loss-of-Coolant Accident Volume III, Supplement 1, Additional Information for Upper Bound PCT Calculation," to Sections S2.2.3.2.4 and S2.2.3.2.4.1. These LTRs have been previously reviewed and approved. The staff agrees that adding these references is an administrative change and therefore is acceptable to the staff.

Add GE14 for Fuel Handling Accident, Section 2.2.3.5

This section requires that the fuel handling accident is analyzed for GE fuel. This analysis is performed using the methods described in Revision 10 to GESTAR. For GE14 fuel, this analysis is documented in Reference S-95 (GE14 Compliance with Amendment 22 of NEDE-24011-P-A (GESTAR II)). This change adds this reference for the analysis of the fuel handling event for GE14 fuel. As the fuel handling analysis methodology has been previously approved, the staff finds this change acceptable.

Table S-5, "Specific Plant Analysis" Update

These changes update Table S-5. This table is for information only and has been updated to reflect the latest information available. The staff agrees that these changes are administrative changes and therefore are acceptable to the staff.

Correct Error in Figure S-2, "Loss-of-Coolant Accident Evaluation Model (SAFER/GESTR Analysis Methods)"

This figure has been updated to reflect the use of CORECOOL code instead of CHASTE for the core heatup model. The use of CORECOOL was approved in NEDC-30996P-A. This LTR has been previously reviewed and approved. The staff agrees that changing this reference in Figure S-2 is an administrative change and therefore is acceptable to the staff.

Correct Typographical Errors

The word lattice was misspelled as lattic. The staff agrees that this change is editorial and therefore is acceptable to the staff.

4.0 CONCLUSIONS

Based on the above, the staff finds that proposed changes are administrative or typographical changes and therefore are acceptable and appropriate for inclusion in Amendment 27 to LTR NEDE 24011-P-A, "GESTAR II."

Principal Contributor: A. Wang

Date: April 6, 2004