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

March 24, 2017

Mr. Scott P. Murray
Manager, Facility Licensing
Global Nuclear Fuel – Americas, L.L.C.
3901 Castle Hayne Road
P.O. Box 780
Wilmington, NC 28402

SUBJECT: REVISED REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF THE MODEL NO. RAJ-II

Dear Mr. Murray:

By letter dated September 30, 2016, as supplemented November 28, 2016, you submitted an application for amendment of the Model No. RAJ–II transportation package, Certificate of Compliance (CoC) No. 9309. You requested approval of changes made to reflect the addition of a GNF3 10x10 fuel assemblies.

By letter dated March 7, 2017 (ML17067A142), we sent a letter providing our requests for additional information. We realized that we inadvertently did not include one of the staff requests in that letter, as discussed during our March 17, 2017, public meeting. The letter has been updated to include question 1(c). We request you provide this information by April 7, 2017. Inform us at your earliest convenience, but no later than March 31, 2017, if a substantial date change is needed. To assist us in re-scheduling your review, you should include a new proposed submittal date.

If you have any questions regarding this matter, please contact me at 301-415-5253.

Sincerely,

/RA/

Huda Akhavannik
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9309
TAC No. L25154

Enclosure: Requests for Additional Information

SUBJECT: REVISED REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF THE MODEL NO. RAJ-II – DATE: MARCH 24, 2017

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Revised Request for Additional Information
Global Nuclear Fuel – Americas, L.L.C.
Docket No. 71-9309
Model No. RAJ-II Package

1.0 General Information

Justify the safety classification/category for the fusible plugs and alumina silicate insulation in the Model No. RAJ-II package.

a) Section 1.2.1.2 of the safety analysis report (SAR) describes the use of fire consumable fusible plugs on the outer and inner containers to prevent pressure buildup. SAR Drawings, including 105E3738 (Revision 10), 105E3743 (Revision 7), 105E3745 (Revision 10), 105E3747 (Revision 6), and 105E3748 (Revision 4), identify the fusible plug components with "importance to safety" classifications of "B" or "C" (plug/gasket). Guidance in NUREG/CR-6407, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety, " suggests that the plug components should have an importance to safety classification/category of "A".

b) SAR Section 3.2.1 mentions that the alumina silicate insulation is used "… to repel the rate of heat transfer to the fuel during the fire event." SAR Drawings, including 105E3745 (Revision 10), 105E3747 (Revision 6), and 105E3748 (Revision 4), identify the alumina silicate insulation with a NURE/CR-6407 importance to safety classification of "B". Guidance in NUREG/CR-6407 suggests that the thermal components, including insulation, should have an importance to safety classification/category of "A".

c) SAR Section 1.2.1 mentions, "…wood and a honeycomb resin impregnated craft paper (hereinafter called "paper honeycomb") are placed as shock absorbers to reduce shock due to a drop of the package", and so act as impact limiters. Drawing No. 105E3741, Rev. 3 lists paper honeycomb as a "shock absorber" with category "B" and drawing no. 105E3738, Rev. 10, lists the lumber (balsa) as category "B". Guidance in NUREG/CR-6407 suggests that the impact limiters should have an importance to safety classification/category of "A".

This information is needed to determine compliance with 10 CFR 71.31(a)(1), 71.33.

3.0 Thermal

3-1 Provide a quantitative analysis to demonstrate that the package, with the cumulative effect of the 10 CFR 71.73 hypothetical accident conditions, would not exceed the regulatory release.

SAR Section 2.7.4 stated that the maximum hypothetical accident condition testing temperature for an earlier-designed fuel assembly was 921 K (1198°F) and that the fuel rod pressure due to accident conditions does not exceed 508 psig (522.7 psia). The SAR also stated that the fuel rods have a rupture pressure in excess of 520 psi

(pressure value was not provided). It was not evident that the condition (e.g., strain) of the modified fuel assemblies' deformed fuel rods, after the hypothetical accident condition 30 ft drop (end drop, side drop, etc.) and puncture tests, was quantitatively considered when analyzing at the high temperatures and pressures (e.g., 1198°F and 508 psig) of the thermal hypothetical accident condition and during subsequent calculations that are used for input in the certificate of compliance fuel parameter tables.

This information is needed to determine compliance with 10 CFR 71.51(a)(2) and 71.73.

3-2 Provide the analysis that demonstrates the benchmarked creep test data/model can be used to evaluate the creep thermal performance criteria for BWR ($r/t|_{BWR} * P_f * 921/293 - P_a$) ≤ 31.1 MPa (4,514 psi)) and non-BWR ($r/t|_{non\text{-}BWR} * P_f * 921/293 - P_a$) ≤ 56.3 MPa (8,166 psi)) fuel.

The response to RSI 3-1 indicated that some of the fuel designs used in the RAJ-II package were outside the range of the creep test parameters. However, there was no analysis provided that demonstrated the validity of the creep tests results/model for determining the BWR and non-BWR allowable stress and thermal stress criteria presented in SAR Sections 3.4.4.1 and 3.4.4.2.

This information is needed to determine compliance with 10 CFR 71.51 and 71.73.

4.0 Containment

4-1 Specify the minimum cladding thickness in Table 4, "Fuel Rod Parameters," of the draft Revision 11 of the CoC proposed by the applicant.

In the draft proposed Revision 11 of the CoC, the applicant requested removing the cladding thickness from Table 4, "Fuel Rod Parameters." In contrast, CoC Sections 5(b)(1)(iv) and (v) both reference the minimum clad thickness in Table 4. When comparing the Fuel Rod OD and Cladding ID parameters in Table 4, the fuel could effectively have a cladding thickness of zero. Since the fuel cladding is part of the containment boundary, removal of the cladding thickness parameter and the possibility of a zero clad thickness is not appropriate. The fuel cladding thickness in Table 4, "Fuel Rod Parameter," and Table 3, "Fuel Assembly Parameter," should reflect the values that have been demonstrated to meet structural, thermal, and containment performance during NCT and HAC.

This information is necessary to determine compliance with 10 CFR 71.51(a) and (b).

7.0 Operating Procedures

7-1 Revise the title for Table 7-1, "Recommended Packaging Component Torques," to, "Required Packaging Component Torques." Revise Table 7-1 to provide a plus or minus ft-lb torque value next to all the torque values listed in the torque column. Revise the Table 7-1 note and the text throughout Chapter 7 from "recommended torque" to "required torque."

This information is necessary to determine compliance with 10 CFR 71.87(c).