



71-9294

**Global Nuclear Fuel**

A Joint Venture of GE, Toshiba, &amp; Hitachi

September 30, 2002

Mr. E. William Brach, Director  
Spent Fuel Project Office, M/S O-13D13  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Mr. Brach:

**Subject:** Request for Revision to the Application for the New Powder Container (NPC) to Include an Expedited Approval for Heterogeneous Materials and Other Changes that do not Affect Safety

**Reference:** Docket 71-9294, USA/9294/AF-85

The Global Nuclear Fuel - Americas, L.L.C. (GNF) facility in Wilmington, North Carolina, hereby requests changes to the Safety Analysis Report (SAR) for the NPC package. The changes being requested primarily involve revising Chapter 6.0, Criticality Safety Evaluation, in its entirety for approval to ship heterogeneous materials in addition to the current content authorization. We also request changing the drawing numbers in the SAR to agree with our current engineering department practice and various other corrections that we believe are minor in nature and do not affect the package's safety as tested. The following is a description of the Attachments to this letter.

Attachment 1 contains a description and explanation of all changes being requested and where in the application they may be found (six copies are provided).

Attachment 2 is the revision to Chapter 6.0, Criticality Safety Evaluation, in its entirety. Each page is identified with the docket number, Revision 2 and the date of 9/2002. Changes from the current Chapter 6.0 are identified with a vertical line in the right hand column (six copies are provided).

Attachment 3 contains the pages and drawings that have changed in the SAR as described in Attachment 1. They should be inserted as replacement pages/drawings in the SAR documents you have (six copies are provided).

Attachment 4 contains proposed word changes to NRC Certificate of Compliance (COC) 9294 (six copies are provided).

The following are provided to assist in your review:

Attachment 5 contains three copies of the drawing (8 sheets each). Changes are highlighted in yellow.

NMSB1

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Attachment 6 contains three copies of Chapter 6.0 that show the deleted text with blue strikethrough lines and the new text/data in red.

Changes to the SAR pages are identified with a vertical line in the right hand margin, contain the next revision number and are dated 9/2002 at the top of the page. Since the pages in the hard copies are back-to-back, the page on the reverse side of the page being changed will remain exactly as it is in the current revision if nothing changed on that page.

The expedited approval is requested, because GNF is approaching a serious shortfall in uranium available to meet our customer commitments for delivery of fuel and powder. The shortfall becomes particularly critical beginning in March-April 2003. As a result, it is critical for our business to be able to ship heterogeneous materials covered by this amendment request no later than early January 2003.

The urgency has been brought on by the facts GNF had planned to use the older BU-J packages for a period of time to handle the uranium resource recovery work which is volume versus payload limited. As a result of the discontinuance of the use of the BU-J, GNF has ordered and is now beginning to receive additional new NPC packages. We are therefore in a position to begin full utilization of our newly expanded NPC package fleet for both homogeneous and heterogeneous authorization as soon as it is approved by the NRC.

Please contact me on (910) 675-5656 if you have any questions or would like to discuss this matter further.

Sincerely,

Global Nuclear Fuel – Americas, LLC

A handwritten signature in black ink that reads "Charles M. Vaughan". The signature is written in a cursive style with a large, prominent initial "C".

Charles M. Vaughan, Manager  
Facility Licensing

/zb  
Attachments

cc: CMV-02-045

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
Table of Contents (page iii, iv and v)	The Table of Contents was revised to reflect title and pages changes. Also, page v was added due to repagination.
Section 1.1, Introduction (Page 1-1)	Added provision to include heterogeneous as well as homogeneous material. Changed the term "uranium powder" to "uranium bearing material". Changed the term "uranium oxide powder" to "uranium oxides or compounds". Also, changed the words "powder plus powder packaging" to "...per package (includes packaging)".
Section 1.2.1.1, Packaging Description and Section 1.2.1.1.1, Outer Confinement Assembly (page 1-4)	Added wording to expand authorized content to include homogeneous or heterogeneous uranium bearing material. Changed "uranium oxide powder" to "uranium bearing material". Also, changed description of payload from "uranium oxide powder" to "uranium oxides and compounds".
Section 1.2.1.1.2, Inner Containment Canister Assembly (page 1-5)	Removed the word "powder" from "powder receptacles".
Section 1.2.1.3, Neutron Moderation and Absorption (page 1-5)	Changed "uranium oxide powder payload" to "uranium bearing payload". Also, changed the words "powder plus powder packaging" to "uranium bearing material".
Section 1.2.1.5, Heat Dissipation (page 1-5)	Changed the words "uranium oxide powder" to "uranium oxides and compounds".
Section 1.2.1.10, Shielding (page 1-6)	Changed the word "uranium oxide powder" to uranium oxides and compounds".
Section 1.2.3, Contents of Packaging (page 1-7)	Changed the wording to include a table that provides the type, form and maximum quantity of material per package. This table includes footnotes showing metal exclusions and a statement that the material form within every NPC must be the same. Also, provided clarification wording in the last paragraph.

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
Appendix 1.3, Section 1.3.1 (page 1-8)	The drawing numbers have been changed from 0019D0001 through 0019D0008 to 177D4970, Sheets 1 through 8, Revision 0, in order to be consistent with current GNF engineering department practice.
Appendix 1.3 (Drawings)	<p>The sheets described above are included in this Appendix. Changes include:</p> <ul style="list-style-type: none"> <li>(1) The phrase "Essential to Safety" has been added to the first seven sheets of the packaging drawing. This is consistent with our internal procedures and Regulatory Guide 7.10, Appendix A requirements.</li> <li>(2) The title block format has been revised.</li> <li>(3) The drawing number and sheet number have been added to the top right and right margin of each sheet.</li> <li>(4) The scale designations were removed, because they apply to the 24" x 36" drawing not the 11" x 17" drawing. Actual measurements of components are provided elsewhere on the drawings.</li> </ul> <p>The size of the lettering on the drawings was standardized.</p>
Appendix 1.3, Drawing 177D4970, Sheet 2, Revision 0	<p>Coordinates C-2 formerly called out the cover (item 50) but pointed to the lift tube (Item 5). The cover was not clearly shown in the side view at coordinates C-3. Also, the 2-15/16" length dimension of the cover plate was incorrect. To clarify the cover, "Detail U" was added at coordinates F-10. This Detail shows the relationship between the guard (Item 9) and the cover. The cover plate is now accurately depicted at coordinates C-2 and C-6 (side views) as well as the frontal view at C-3. The 2-15/16" is corrected to the actual dimension of 2-5/8".</p> <p>(continued on next page)</p>

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
<p>Appendix 1.3, Drawing 177D4970, Sheet 2, Revision 0</p> <p>(continued from previous page)</p>	<p>The changes are merely a clarification of the presentation and the correction of the length dimension. There is a slight gap between the lift tube (Item 5) and the cover plate that can be seen in the frontal view. The gap is only 3/16" wide, which is too small to insert any item capable of moving the 2870 lb NPC. The package's margin of safety has not been reduced in any way by this clarification and dimensional correction. The lift pockets are still disabled for transport.</p>
<p>Appendix 1.3, Drawing 177D4970, Sheet 6, Revision 0</p>	<p>The following four items are to clarify material designations and thread specifications.</p> <ol style="list-style-type: none"> <li>(1) Detail "T" formerly specified the retainer (coordinates F-10) as AMS 5517. The material designation and descriptive characteristics have been changed to the actual material used, AMS 5510. AMS 5510 has a lower yield strength than AMS 5517. However, AMS 5510 was used in the original four certified test units and in the production run of the NPCs. AMS 5510 having been the material used in the test units validates the material's ability to perform its safety function in maintaining the lid of the ICCA in place during accident conditions. The vendor changed the material callout shortly before production began, and the change was not reflected in the SAR. This material specification clarification does not reduce the safety of the container in any way as demonstrated by the certification tests.</li> <li>(2) The material specification for the T-bolt (coordinates C-4) was originally labeled A-268. A-268 applies to tubing. A-286 applies to bar stock, which is the material the T-bolt is made from. The specification has been changed to A-286. This appears to have been a transposing error. The vendor has always specified and used A-286.</li> </ol> <p>(continued on next page)</p>

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
<p>Appendix 1.3, Drawing 177D4970;            Sheet 6, Revision 0</p> <p>(continued from previous page)</p>	<p>(3) The thread specification for the T-bolt SAR (coordinates C-4) was incorrectly translated to the NPC drawing as a 5/16-24UNF thread. The vendor specified a 5/16-24UNJF T-bolt for this application. The UNF has been corrected to UNJF for the T-bolt.</p> <p>The specification for the nut has also been changed to UNJF (coordinates C-3). The <i>dedicated</i> 5/16-24UNF nuts were felt to be causing unnecessary galling of the bolt because of the slight difference in thread design. This change should eliminate the operational problem.</p> <p>(4) The material specification for the trunnion (coordinates C-2) was originally labeled AMS 5523. AMS 5523 is a specification for 309S stainless steel sheet strip and plate. However, AMS 5525 is for A-286 super alloy sheet strip and plate. The A-286 is part of the material call out. The vendor used AMS 5525 in all retainer clamps furnished for the NPCs for both the band clamps used on the qualifying test units and the production run of the NPCs. This also is a transposing error that is being corrected with this submittal.</p> <p>None of the above corrections change any hardware. Therefore, there is no reduction in the safety of the package introduced by these corrections.</p>
<p>Section 2.1, Structural Design            (page 2-1)</p>	<p>Changed "uranium oxide powder payload" to uranium bearing payload".</p>
<p>Section 2.1.1, Discussion            (page 2-1)</p>	<p>Changed the T-bolt callout from UNF to UNJF to conform to the drawing change on Sheet 6.</p>

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
Section 2.4.4 and 2.5 (page 2-5)	The 3/4/02 submittal corrected the material specification of Item 5 (Lift Tube) on drawing 0019D0001 to 304 stainless steel. The text of sections 2.4.4 and 2.5 are revised to reflect this correction. Additionally, the affected physical properties in the table in Section 2.5 have been changed to show 304 stainless steel values and the appropriate ASME B&PV Code references.
Section 2.4.5 (page 2-5)	Changed the term "uranium oxide powder radioactive material" to "uranium bearing radioactive material".
Section 2.5.1 (page 2-6)	The original weight of the NPC submitted in the Revision 0 (5/16/00) application was 2850 lbs. The weight was later revised to 2870 lbs to reflect the addition of corner reinforcements and increasing the ICCA moderator thickness. Sections 1.2.1.1, 1.2.1.2, 2.2, and 2.6.9 state the NPC weight as 2870 lbs. Section 2.5.1 has been revised to reflect the 20 lb weight increase and the change in the yield strength of the 304 stainless steel used in the lift tube. The yield strength is taken from the physical properties table in Section 2.5. The equations have been modified to reflect these changes.
Section 2.5.2 (pages 2-6 and 2-7)	<p>This section develops the minimum area of any restraint used on the NPC assuming a full line of contact equal to the length (or width) of the NPC. The development was based on the use of a 10g load being applied to any side or to the top surface of an NPC. 10CFR 71.45 (b) (1) requires consideration be made for a 10g longitudinal (to the conveyance's direction of travel), a 5g transverse, or a 2g vertical loading. This section has been revised to separate the loadings in the horizontal plane (10g and 5g) from the loading in the vertical direction (2g).</p> <p>The lift tubes which connect to the bottom of the NPC and support the NPC are designed to provide sufficient bearing area to meet 10CFR 71.45(b)(1) requirements.</p> <p>(continued on next page)</p>

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
<p>Section 2.5.2            (pages 2-6 and 2-7)             (continued from previous page)</p>	<p>The section now calculates the minimum restraint contact area for a 10g load, but the load is restricted to occur on any side of the NPC (in the horizontal plane). The NPC is geometrically square and can therefore be loaded with any side facing the direction of the conveyance's travel. Hence, the minimum contact area determined by the 10g load can occur on any side of the NPC.</p> <p>The calculation for the minimum restraint contact area on the top of the NPC based on a 2g vertical load is added to the section. The NPC will always be maintained upright. Thus the 10CFR 71.45(b)(1) maximum 2g load may be used to specify a smaller minimum contact area for restraints bearing on the top surface of the NPC. The smaller allowable contact area on the top surface of the NPC enables the use of more efficient packing and bracing to maintain the NPCs in place during transport.</p> <p>The use of 2g loading in the vertical direction more closely aligns the restraint system to the regulatory requirements. There is not reduction in the restraint system to a level less than that required by 10CFR 71.45(b)(1). Therefore, the package is still safe with this new vertical loading.</p> <p>The foam compressive stress in this section has also been revised to conform to the foam compressive stress values in the 8/1/01 submittal. The adjustment to the compressive stresses reduces the required amount of the contact area. Hence, the presently designed NPC packing and bracing is conservative in bearing area applied to the NPC.</p> <p>In the second paragraph of Section 2.5.2, Tie-Down Devices, the first two sentences have been combined to correct a grammatical error.</p>
<p>Section 2.7.2, Crush            (page 2-11, first paragraph)</p>	<p>Changed "uranium oxide payload" to "uranium oxides and compounds payload".</p>

Description and Explanation of Requested Changes

Location in SAR	Description / Explanation
Section 3.3 Technical Specification for Components (page 3-3)	Changed "UO <sub>2</sub> " to "uranium bearing material".
Section 4.1.1 Containment Vessel (page 4-1)	Changed "uranium oxide powder payload" to "uranium bearing payload".
Section 7.1.2, 1., Loading the Payload into the NPC (page 7-2)	Changed "uranium oxide payload" to "uranium oxides and compounds payload". Changed "powder plus powder packaging" to "uranium compounds plus packaging".
Section 7.2.2, 7., Removal of the Payload from the NPC Package (page 7-4)	Changed "uranium oxide contents" to "uranium contents". Changed "powder receptacle" to "receptacle".
Section 8.1.4.1.2.2.1, Density (page 8-6)	<p>This section describes the method used to determine the density of the foam. The method is to measure the height, width, length and weight of the sample, then calculate the density by dividing the sample weight by volume. Because the weight and the dimensions of the sample are accurately measured, the density calculated will be the same on a sample that has the nominal dimensions given in this section, or a smaller or larger sample. The use of the word "minimum" is contradictory to the word "nominal". The word "minimum" has been removed from the second sentence in the first line item. The sentence now requires a rectangular sample with nominal dimensions of 1" x 2" x 2". Small variations about the nominal dimensions e.g. ± 0.1" will be compensated for by the calculation using the accurately determined dimensions and sample weight. Thus, the change does not affect the calculated and reported density of any sample. There is no impact to safety associated with this change. The change is merely clarifying of wording.</p>