

December 19, 2008

U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2738

Attn: Document Control Desk

Subject: Supplemental Information to the Request for Authorization for One-Time Shipment of Irradiated THAR Fuel Elements in a 42 MTR Basket in the NAC-LWT Cask

Docket No. 71-9225

- Reference:
1. Safety Analysis Report (SAR) for the NAC Legal Weight Truck Cask, Revision 38, NAC International, November 2007 – as Supplemented
  2. Model No. NAC-LWT Package, U.S. Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) No. 9225, Revision 49, October 10, 2008
  3. Request for Authorization for One-Time Shipment of Irradiated THAR Fuel Elements in a 42 MTR Basket in the NAC-LWT Cask, NAC International, November 4, 2008
  4. Request for Additional Information for Review of the Certificate of Compliance No. 9225, Revision for the Model No. NAC-LWT Package, TAC No. L24181, NRC, October 31, 2008
  5. Supplemental Information to the Request for Authorization for One-Time Shipment of Irradiated THAR Fuel Elements in a 42 MTR Basket in the NAC-LWT Cask, NAC International, November 18, 2008

NAC International (NAC) hereby provides supplemental information in support of Reference 3 based on the NRC/NAC teleconference held on December 19, 2008.

Reference 3 requested authorization for a one-time shipment of Irradiated THAR Fuel Elements in a 42 MTR Basket in the NAC-LWT Cask. The fuel intended for shipment meets all applicable requirements for MTR fuel as described in Reference 2 with four listed exceptions. The purpose of this communication is to provide technical justification in all applicable engineering disciplines for the acceptability of the described fuel to grant authorization for a one-time shipment in the NAC-LWT Cask.

The particularities of the subject fuel not currently addressed in Reference 1 are as follows:

- Reduced Clad Thickness
- Maximum  $^{235}\text{U}$  per Plate Limit of the CoC Exceeded
- Fuel Assemblies Have Been Disassembled and Reconstituted
- Epoxy Coating



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Each of the particularities has been evaluated for all disciplines during the preparation of Reference 3. Results of these evaluations are summarized in the following tables.

<b>REDUCED CLAD THICKNESS</b>		
<b>Discipline</b>	<b>Impact on Current CoC</b>	<b>Justification</b>
Structural	No Impact	Maximum allowed weight of MTR elements is not modified. Minimum plate thickness is increased. MTR plates are aluminum based core materials. Clad thickness decrease has no effect on fuel performance in cask. Fuel meat exposure criteria currently specified in certificate are not modified.
Thermal	No Impact	Per element heat load or number of fuel plates allowed are not modified.
Containment	No Impact	Transported in a leaktight containment shipping configuration as described in Reference 5.
Shielding	No Impact	Neither fuel element radiation source nor fuel element mass are modified; therefore, no shielding effect.
Criticality	Revised as previous calculations indicated a minor effect of clad versus core thickness	See Criticality Considerations included in Reference 3. See following Note.

Note: NAC provided the THAR fuel content criticality analysis input and output data files on CD media in support of the criticality considerations described in Reference 3.

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MAXIMUM <sup>235</sup> U PER PLATE LIMIT OF THE CoC EXCEEDED		
Discipline	Impact on Current CoC	Justification
Structural	No Impact	Maximum allowed weight of MTR elements is not modified.
Thermal	No Impact	Maximum element fuel mass and heat load are not modified. No thermal effect.
Containment	No Impact	Bounding fuel element mass (total mass per element) and, therefore, total containment source not modified by request. Furthermore, a leaktight containment shipping configuration is applied as described in Reference 5.
Shielding	No Impact	Total per element source is not increased as total fissile material mass is not increased (i.e., maximum number of plates are limited by total element fuel mass).
Criticality	Increased Maximum <sup>235</sup> U per Plate to 24.5 g	See Criticality Considerations included in Reference 3. See following Note.

Note: NAC provided the THAR fuel content criticality analysis input and output data files on CD media in support of the criticality considerations described in Reference 3.

FUEL ASSEMBLIES HAVE BEEN DISASSEMBLED AND RECONSTITUTED		
Discipline	Impact on Current CoC	Justification
Structural	N/A	Reconstituted fuel assemblies meet all characteristics of a MTR fuel assembly. No modification has been made to the individual fuel plates.
Thermal	N/A	
Containment	N/A	
Shielding	N/A	
Criticality	N/A	

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<b>EPOXY COATING</b>		
<b>Discipline</b>	<b>Impact on Current CoC</b>	<b>Justification</b>
Structural	No Impact	Epoxy coating applied to edge of fuel elements only. No structural effect due to insignificant mass.
Thermal	No Impact	No effect on system heat load or analysis considering heat transfer surfaces.
Containment	No Impact	Transported in a leaktight containment shipping configuration as described in Reference 5. Per Reference 3, no significant hydrogen or oxidizing gases generated and/or are available for release.
Shielding	No Impact	Insignificant mass. No significant source; therefore, no shielding effect.
Criticality	No Impact	Due to insignificant mass, no effect on criticality.

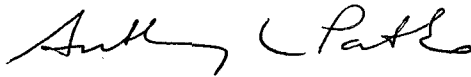
The particularities described herein do not have any impact on any of the other chapters (i.e., Chapter 7 – Operating Procedures, Chapter 8 – Acceptance Testing) of Reference 1. Shipment preparation and package maintenance are unaffected by the characteristics addressed in Reference 3, Reference 5 and this communication. As stated in Reference 3, the planned shipment will be performed in accordance with all the applicable requirements of the current revision of the Model No. NAC-LWT Package CoC No. 9225.

It is planned that the THAR fuel shipment will be performed in the summer of 2009. To support the shipment schedule and any unanticipated delays, the authorization is requested to be valid until December 31, 2009. In order to support shipment planning activities and necessary interaction with the appropriate Foreign Competent Authorities, NAC requests the authorization to be issued by January 16, 2009.

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If you have any comments or questions, please contact me on my direct line at 678-328-1274.  
All requested information will be provided in a prompt manner.

Sincerely,



Anthony L. Patko  
Director, Licensing  
Engineering