

August 2, 2017

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

Attention: Document Control Desk

Subject: Supplement to Submission of NAC Responses to NRC's Request for Additional Information to NAC's Request for Certificate of Compliance (CoC) No. 9225 for the NAC-LWT

Docket 71-9225

- References:
1. USNRC CoC No. 9225, Revision 67, Model No. NAC-LWT Package, Dated October 14, 2016
 2. USNRC CoC No. 9225, Revision 64, Model No. NAC-LWT Package, Dated June 24, 2015
 3. ED20150112, Submission of NAC-LWT Safety Analysis Report (SAR), Revision 44 Incorporating Highly Enriched Uranyl Nitrate Liquid (HEUNL) and the SLOWPOKE Fuel Core Approved Application, August 18, 2015
 4. ED20160104, Submission of a Request for a Revision to Certificate of Compliance (CoC) No. 9225 for the NAC-LWT Cask Incorporating Changes to the Authorized NRU/NRX Fuel Content, December 23, 2016
 5. NRC Letter, Request for Additional Information for Review of the Model No. NAC-LWT, April 7, 2017
 6. ED20160047, Submission of NAC Responses to NRC's Request for Additional Information to NAC's Request for Certificate of Compliance (CoC) No. 9225 for the NAC-LWT, May 15, 2017
 7. ED20170048, Supplement to Submission of NAC Responses to NRC's Request for Additional Information to NAC's Request for Certificate of Compliance (CoC) No. 9225 for the NAC-LWT, May 18, 2017
 8. NRC/NAC Teleconference, June 7, 2017

NAC International (NAC), hereby, submits supplemental information based on the discussions during the June 7, 2017 (Reference 8) teleconference with the NRC. The supplemental information presented via Attachment 2 provides further characterization of the damaged NRU/NRX fuel requested to be approved as authorized contents in the NAC-LWT, including preliminary criticality evaluations based on the refined definition of damaged NRU/NRX fuel.

Nuclear Regulatory Commission

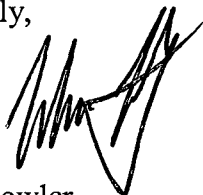
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Attachment 2 contains proprietary information and is requested to be withheld from disclosure per 10 CFR 2.390 via the affidavit contained in Attachment 1. Attachment 3 provides a non-proprietary version of Attachment 2. Approval of the NAC-LWT CoC is requested by September 1, 2017 in support of anticipated NAC-LWT transport projects. In accordance with NAC's administrative practices, upon final acceptance of this application, the NAC-LWT SAR Revision 16B and 17A changed pages will be reformatted and incorporated into the next revision of the NAC-LWT SAR.

If you have any questions regarding this letter, please feel free to contact me on my direct number at 678-328-1236.

Sincerely,



Wren Fowler
Director, Licensing
Engineering

Attachments

1. NAC International Inc. Affidavit Pursuant to 10 CFR 2.390
2. Supplemental Information Related to Defining Damaged NRU/NRX Fuel (Proprietary Version)
3. Supplemental Information Related to Defining Damaged NRU/NRX Fuel (Non-Proprietary Version)

Attachment 1

**NAC International Inc.
Affidavit Pursuant to 10 CFR 2.390**

NAC INTERNATIONAL INC.
AFFIDAVIT PURSUANT TO 10 CFR 2.390

George Carver (Affiant), Vice President, Engineering and Licensing, of NAC International Inc., hereinafter referred to as NAC, at 3930 East Jones Bridge Road, Norcross, Georgia 30092, being duly sworn, deposes and says that:

1. Affiant has reviewed the information described in Item 2 and is personally familiar with the trade secrets and privileged information contained therein, and is authorized to request its withholding.
2. The information to be withheld includes the following NAC Proprietary Information that is being provided in support the technical review of NAC's Request for a Certificate of Compliance (CoC) (No. 9225) for the NAC LWT Transport Package.
 - ED20170068 – Attachment 2, Supplemental Information Related to Defining Damaged NRU/NRX Fuel (Proprietary Version)

NAC is the owner of this information that is considered to be NAC Proprietary Information.

3. NAC makes this application for withholding of proprietary information based upon the exemption from disclosure set forth in: the Freedom of Information Act ("FOIA"); 5 USC Sec. 552(b)(4) and the Trade Secrets Act; 18 USC Sec. 1905; and NRC Regulations 10 CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial financial information obtained from a person, and privileged or confidential" (Exemption 4). The information for which exemption from disclosure is herein sought is all "confidential commercial information," and some portions may also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4.
4. Examples of categories of information that fit into the definition of proprietary information are:
 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by competitors of NAC, without license from NAC, constitutes a competitive economic advantage over other companies.
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality or licensing of a similar product.
 - c. Information that reveals cost or price information, production capacities, budget levels or commercial strategies of NAC, its customers, or its suppliers.
 - d. Information that reveals aspects of past, present or future NAC customer-funded development plans and programs of potential commercial value to NAC.
 - e. Information that discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information that is sought to be withheld is considered to be proprietary for the reasons set forth in Items 4.a, 4.b, and 4.d.

5. The information to be withheld is being transmitted to the NRC in confidence.

**NAC INTERNATIONAL INC.
AFFIDAVIT PURSUANT TO 10 CFR 2.390**

6. The information sought to be withheld, including that compiled from many sources, is of a sort customarily held in confidence by NAC, and is, in fact, so held. This information has, to the best of my knowledge and belief, consistently been held in confidence by NAC. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements, which provide for maintenance of the information in confidence. Its initial designation as proprietary information and the subsequent steps taken to prevent its unauthorized disclosure are as set forth in Items 7 and 8 following.
7. Initial approval of proprietary treatment of a document/information is made by the Vice President, Engineering, the Project Manager, the Licensing Specialist, or the Director, Licensing – the persons most likely to know the value and sensitivity of the information in relation to industry knowledge. Access to proprietary documents within NAC is limited via “controlled distribution” to individuals on a “need to know” basis. The procedure for external release of NAC proprietary documents typically requires the approval of the Project Manager based on a review of the documents for technical content, competitive effect and accuracy of the proprietary designation. Disclosures of proprietary documents outside of NAC are limited to regulatory agencies, customers and potential customers and their agents, suppliers, licensees and contractors with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
8. NAC has invested a significant amount of time and money in the research, development, engineering and analytical costs to develop the information that is sought to be withheld as proprietary. This information is considered to be proprietary because it contains detailed descriptions of analytical approaches, methodologies, technical data and/or evaluation results not available elsewhere. The precise value of the expertise required to develop the proprietary information is difficult to quantify, but it is clearly substantial.
9. Public disclosure of the information to be withheld is likely to cause substantial harm to the competitive position of NAC, as the owner of the information, and reduce or eliminate the availability of profit-making opportunities. The proprietary information is part of NAC’s comprehensive spent fuel storage and transport technology base, and its commercial value extends beyond the original development cost to include the development of the expertise to determine and apply the appropriate evaluation process. The value of this proprietary information and the competitive advantage that it provides to NAC would be lost if the information were disclosed to the public. Making such information available to other parties, including competitors, without their having to make similar investments of time, labor and money would provide competitors with an unfair advantage and deprive NAC of the opportunity to seek an adequate return on its large investment.

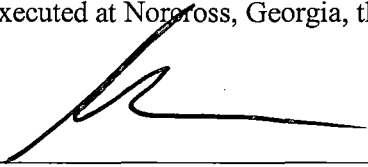
NAC INTERNATIONAL INC.
AFFIDAVIT PURSUANT TO 10 CFR 2.390

STATE OF GEORGIA, COUNTY OF GWINNETT

Mr. George Carver, being duly sworn, deposes and says:

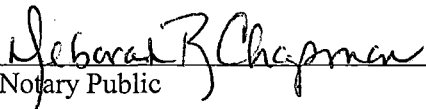
That he has read the foregoing affidavit and the matters stated herein are true and correct to the best of his knowledge, information and belief.

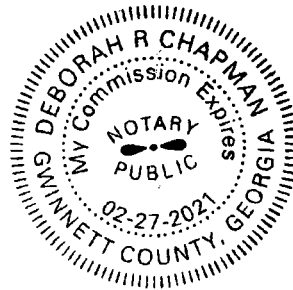
Executed at Norcross, Georgia, this 2nd day of August 2017.



George Carver
Vice President, Engineering and Licensing
NAC International Inc.

Subscribed and sworn before me this 2nd day of August, 2017.


Notary Public



Attachment 3

**Supplemental Information Related
to Defining Damaged NRU/NRX Fuel
(Non-Proprietary Version)**

NRC RAI on Clad Damage and “Missing” Rod Definition

NRC has raised questions on the NRU/NRX damaged fuel application in the context of the allowed clad damage and the “up to a full assembly” definition for quantity of material allowed. While NAC believes that the conservatism inherent in the previously reviewed application (for undamaged fuel) provides reasonable assurance that damaged fuel will be criticality safe a revised payload definition may be required to demonstrate acceptable criticality results in the context of verbatim compliance. The following sections are designed to support the following fuel definitions.

Updated NRU/NRX Fuel Definitions

Undamaged NRU or NRX Fuel Assembly

NRU HEU and NRX HEU contain uranium aluminum alloy fuel meat. NRU LEU fuel meat is U-Al-Si. Fuel assemblies may be cropped. NRU fuel assemblies have their flow channel removed. Fuel rod clad may show signs of mechanical damage or corrosion provided structural integrity is maintained and that there is no known clad through damage (i.e., fuel exposure). Loose rods, up to the equivalent number of a fuel assembly, are considered undamaged provided they retain their structural integrity and meet the clad requirements. Loose rods must be placed into a caddy.

Damaged NRU or NRX Fuel Assembly, Rod, or Rod Segments

Fuel assemblies, loose rods or rod segments that do not meet the structural or clad integrity requirements of the undamaged NRU or NRX fuel assembly. Loose fuel rods defined as damaged, or rod segments, must be loaded in the NRU/NRX caddy prior to placement into the NRU/NRX basket. Damaged NRU assemblies may be loaded into the NRU/NRX basket tube without use of a caddy. NRU/NRX basket and basket lid, including screens, provide the gross material boundary for damaged fuel (i.e., gross material is retained in basket tube). Clad thru damage is limited to 5% of the fueled surface area. Clad removed (i.e., clad originally associated with rod no longer present) is limited to 2% of the fueled surface area.

Issue: Clad Damage Allowed for the NRU/NRX Payload

Previous applied terminology in the NAC-LWT SAR is as follows and was intended to be applicable to NRU and NRX fuel as both are aluminum based fuels.

“Undamaged Aluminum Based Fuel

Aluminum-based reactor fuel plates/elements that are structurally sound, but may have fuel core exposure due to corrosion or mechanical damage of the clad. Through-clad corrosion and/or mechanical damage is limited to 5% of the fueled surface area of the element. “

This definition was not intended to be applicable to a hypothetical scenario of a uniform reductions in clad cross-sectional area. Defined is fraction of surface area effected not fraction of clad. It is intended to address localized, distributed, fuel exposure/through clad damage to the fuel element/rod clad during

NAC PROPRIETARY INFORMATION REMOVED

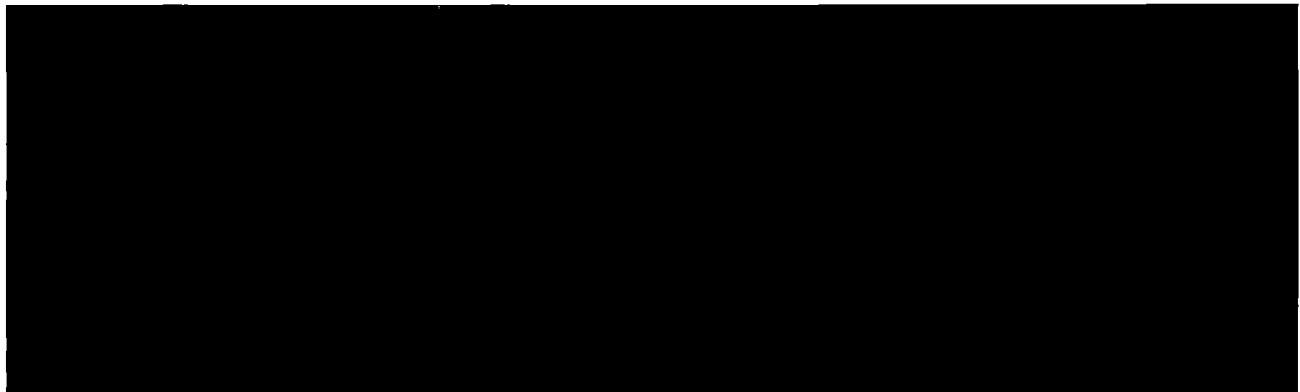
operations such as clad splitting or scenarios such as a cuts/tears through fueled areas during assembly handling/cutting operations. See below for photos of representative geometries for these effects.



None of these scenarios are expected to remove significant quantities of clad from the system in terms of criticality analysis (in particular scenarios which significantly impact the H/U ratio within the lattice).

NAC agrees that hypothetical removal of 5% of the clad either by uniform reduction (not allowed by definition) or by concentrated removal of 5% of the clad (by surface area) would produce a significant increase in system reactivity. As demonstrated by the SAR result section for the NRU/NRX fuel the system is significantly undermoderated at the maximum reactivity condition. As shown in the SAR, significant reactivity margin exists in the system until the assumption was made that the basket tubes are filled by NRU HEU rod segments. Significant margin exist for NRX HEU and NRU LEU fuels. It should be noted that the small margins are the result of NRU HEU fuel cases where no caddy is used (rod sections will be placed in the caddy). As the system is undermoderated further constraining rods inside the caddy would increase system reactivity margin.

For the reasons listed in the previous paragraph only the NRU HEU fuel cases are further discussed in this response.



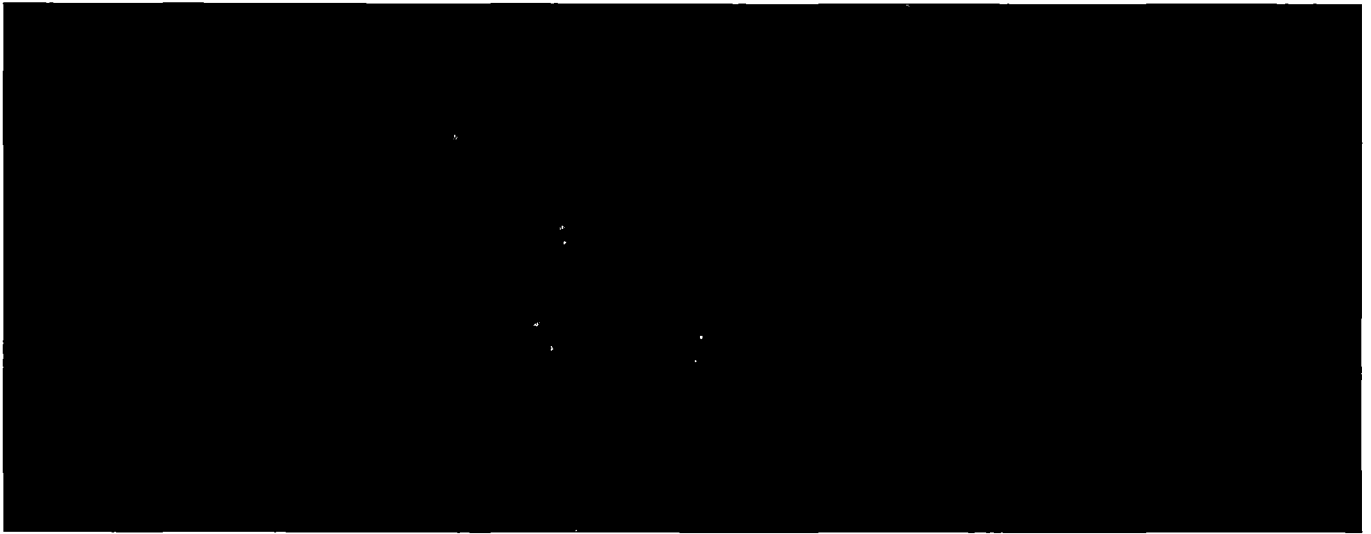


Table 1 **NRU-HEU Results – Loss of Clad**

A large, solid black rectangular redaction block covers the entire area where the table data would be located, completely obscuring the information.

Figure 1 Sample model image (VISED) for clad removed in fuel center region.



Issue: Reactivity Impact of Partial Assembly

NRU/NRX fuel definition allow "up to an assembly" worth of material to be loaded. As noted in the Chapter 6 criticality analysis the NRU HEU payload is significantly more reactive than the other NRU/NRX payloads. Only the NRU HEU case is discussed in detail but the conclusion are applicable to all NRU/NRX payloads.



Table 2 NRU Most Reactive Case Rod Removal

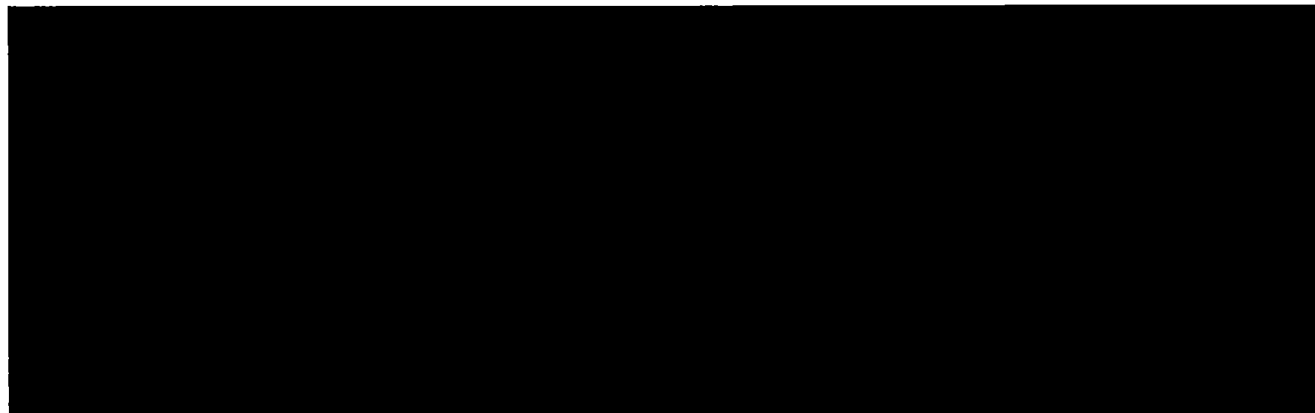


Figure 2

