

October 25, 2007

MEMORANDUM TO: Nader Mamish, Deputy Director  
Licensing and Inspection Directorate  
Division of Spent Fuel Storage and Transportation, NMSS

FROM: Kimberly Hardin, Project Manager /RA/  
Licensing Branch  
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF OCTOBER 17, 2007, MEETING WITH NAC  
INTERNATIONAL TO DISCUSS THE MODEL NO. NAC-LWT PACKAGE  
FOR TRANSPORT OF VARIOUS CHANGES TO THE AUTHORIZED  
FUEL CONTENTS

#### Background

A meeting was held on October 17, 2007, in Rockville, Maryland, to discuss the design of the Model No. NAC-LWT transport package. NAC International (NAC) requested the meeting to specifically discuss two separate upcoming revision requests.

The meeting was noticed on September 13, 2007 (ML0725700730) and modified on October 3, 2007 (ML0727606590). The meeting attendance list is provided as Enclosure No. 1.

#### Discussion

The discussion generally followed the agenda (Enclosure No. 2). The primary reason for the meeting was to discuss two separate upcoming revision requests: (1) to modify the specifications of the currently authorized TRIGA fuel and (2) to add unirradiated and irradiated spent MOX fuel ( $\text{PuO}_2$ ) as new authorized contents.

One revision request will be to modify the currently authorized TRIGA fuel contents by adding low enriched TRIGA fuel with a higher fissile mass than that currently authorized for high enriched TRIGA fuel. This request is planned to support the DOE National Nuclear Security Administration's (NNSA) Foreign Research Reactor (FRR) Program for a shipment to be loaded in spring 2008. Therefore, NAC is requesting an accelerated review consisting of submitting an application in December 2007 and receiving a revised certificate by March 2008. Staff informed NAC that their needs and requests will be considered, but that short of a review time may be difficult, even with a non-complicated technical review. Additionally, other applications' priorities will need to be considered. A schedule and review team will be developed once this application is received.

The other revision request discussed is to add both unirradiated and irradiated MOX fuel as new authorized contents. This request will require a full review team (although some reviewers will not need as much detail in their review). This review will constitute the first

application to request transportation of spent MOX fuel. Two of the major technical aspects of the review were discussed and are described in the following two paragraphs.

NAC stated that they plan to submit the application to request the transport of a mixture of uranium oxide fuel rods in the same basket with the plutonium oxide rods with no specific loading pattern. Staff expressed concern for the benchmark analysis that describes how the applicant calculates the upper safety limit for all of the criticality safety analyses. The actual critical experiments utilized need to be accurate with respect to the system being modeled. There are no known verifiable data that exist for heterogeneous uranium and plutonium systems in existence. NAC plans to do separate benchmarking for uranium and plutonium and provide a rationale for acceptability.

The other major technical aspect of the review discussed entailed the materials review. Staff informed NAC that the ISGs were written for uranium oxides, not plutonium oxides. Any ISGs that NAC plans to use for the MOX application will need a rationale for why the guidance is applicable. Plutonium oxides behave much differently with respect to internal temperatures and pressures and fuel/cladding interactions. Staff would need to review the fabrication process and initial specifications of the unirradiated fuel in addition to the specifications of the irradiated fuel in detail. ISG-11, Rev. 3, was cited as an example for NAC to be particularly aware of with respect to plutonium.

The MOX application is expected to be submitted in December 2007. NAC has requested this revision to be issued by August 2008. Staff informed NAC that a detailed explanation will be necessary to support this type of accelerated review. A schedule and review team, considering priorities, will be developed once this application is received.

NAC also discussed submitting an updated consolidated SAR very soon and other future plans. A copy of the presentation slides is provided as Enclosure No. 3.

Docket No. 71-9225  
TAC No. L24126

Enclosures:

1. Meeting Attendees
2. Agenda
3. Presentation Slides

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**May 14, 2007, Meeting  
between  
NAC International  
and  
the Nuclear Regulatory Commission**

**MEETING ATTENDANCE LIST**

Kim Hardin	NRC/SFST
Robert Nelson	NRC/SFST
Jeremy Smith	NRC/SFST
Michel Call	NRC/SFST
Carl Withee	NRC/SFST
Larry Campbell	NRC/SFST
Chris Bajwa	NRC/SFST
Jason Piotter	NRC/SFST
Andrew Barto	NRC/SFST
Zhian Li	NRC/SFST
Bob Tripathi	NRC/SFST
Nate Jordan	NRC/SFST
Tom Danner	NAC International
Holger Pfeifer	NAC International
Anthony Patko	NAC International
Gary Tjersland	NAC International
Craig Seaman	NAC International
Richard Clark	Shaw Areva MOX Services
Kevin McCoy	Areva NP
Scott Ludwig	Oak Ridge National Laboratory
Bruce Brevard	Oak Ridge National Laboratory
Vince Cooke	Duke Energy
Paul Bailey	Duke Energy
Steve Streutker	Transnuclear
Maureen Conley	Platts McGraw Hill

**Agenda for the  
NRC/NAC-LWT Package Public Meeting  
October 17, 2007, 1:00 – 3:00 pm**

Purpose: To present the contents of NAC-LWT SAR to support an amendment request to add MOX fuel as authorized contents and to discuss current RAIs for the MTR fuel contents revision request. Additionally, a revision of authorized TRIGA contents to support an upcoming FRR shipment will be discussed.

1:00 p.m.	Introduction/Opening remarks	NRC/NAC
1:10 p.m.	Presentation of contents and structure of MOX and any questions regarding the MTR amendment request	NAC
2:00 p.m.	Presentation of revision of authorized TRIGA contents	NRC/NAC
2:40 p.m.	Questions and Answers	NRC/NAC
2:45 p.m.	Public questions/comments	Public/NRC
2:55 p.m.	Closing remarks	NRC/NAC