

June 28, 2011

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

FROM: Pierre Saverot, Project Manager */RA/*  
Licensing Branch  
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF JUNE 2, 2011, MEETING WITH TRANSPORT  
LOGISTICS INTERNATIONAL

### Background

Transport Logistics International (TLI) and Nuclear Cargo + Service (NCS) will be requesting NRC approval for two new package designs, the "U-Protector" package for the transport of UF<sub>6</sub> and the "NCS-45" package for the transport of spent fuel rods. TLI requested this pre-application meeting to present the design of the two packages and a proposed schedule.

### Discussion

Staff discussed general licensing requirements and the fact that NCS/TLI must have, in particular, a Quality Assurance (QA) program approved by NRC. Staff explained that Regulatory Guide No. 7.10 describes a program, identifies the criteria intended to be met, and explains how an applicant will meet the 18 criteria listed in the regulations. Staff said that it will have to perform an audit which would consist in a verification that the programs described in NCS/TLI's QA submittal actually exist and that NCS/TLI can demonstrate their adequate implementation to other package designs that have a European certification. NCS stated that their ISO 9001 certified Quality Manual for the design of packagings has been reviewed and audited by BAM less than 2 months ago, and that it could provide a table referencing ISO requirements and BAM guidance versus NRC requirements. Staff responded that it does not "recognize" ISO because it references its own regulations. However, a potential resolution of this issue might be for NCS to keep its ISO approved program, write a supplement to its QA program and incorporate any additional measures for its implementation aspect. Staff also provided NCS/TLI with a copy of SECY-03-0117 "Approaches for adopting more widely accepted international quality standards."

The "U-Protector" package is designed for the shipment of either commercial grade or reprocessed enriched UF<sub>6</sub> up to a maximum 5 wt%. The 30B cylinders have a wall thickness greater than 11 mm. The package weighs approximately 1,100 kg and consists of a stainless steel shell with phenolic foam filled in layers to guarantee density. Five prototypes have been built for regulatory testing, and contents will be simulated with steel balls. Drop tests are planned to be conducted this summer, along with benchmarking tests. NCS targets a French approval for this package for March 2012, followed by a revalidation in several countries such as Germany, Russia, Netherlands, and Sweden. NCS needs an NRC certificate by July 2012.

Staff said that such a schedule is possible if the application is submitted this early Fall. Staff did mention that phenolic foam must be used with care because it is not chemically inert, while a phenolic resin is, and also referred to Information Notice No. 82-24 on water leaking from UF<sub>6</sub> overpacks.

The NCS-45 package is designed to transport irradiated uranium fuel rods up to 7 wt% enrichment and a burnup up as high as 120 GWd/MTHM, as well as irradiated MOX fuel rods with a maximum enrichment of 94 wt%, a burnup of 120 GWD/MTHM and a cooling time of 120 days. This package was issued a DOT revalidation, under Rev. 0 of the application, on January 22, 2010, as Certificate No. USA/0762/B(U)F-96. NCS does not intend to revalidate Rev. No. 1 of the application but needs both an NRC license (to perform domestic shipments) and a full DOT validation for all contents of the package, i.e., corresponding to Rev. No. 2 of the application.

The containment analysis, performed according to ISO 12807, uses the NUREG-6487 guidance along with the sub-atmospheric pressure in cavity (SPC) approach for different burnups (33, 62, 120 GWD/MTHM) and cooling times (120, 730, and 3650 days). Staff stated that if the package was tested to ANSI criteria, the applicant would not have to perform all calculations per NUREG-6487, and that this would be a "cleaner" way to prove compliance with regulatory requirements. TLI informed staff that the German Competent Authority believes that there is not enough data for cladding and burnup benchmarks above 62 GWD/MTU and NCS is currently performing proprietary data acquisition and development to supplement Rev. 2 of the package application and respond to the needs of their Competent Authority. The shielding analysis is performed with SCALE/SAS4 with several dose rate formulas and TLI stated that it is in compliance with IAEA TS-R-1 criteria. The application includes a specific criticality analysis for each acceptable content of the package with variation of water flooding, rearrangement of the contents, variation of the pin diameter and of debris size as well as evaluation of inhomogeneous arrangements for a single package under NCT and HAC.

Staff said that the current shielding analysis uses a unique method, with formulas to calculate the source term from SAS2H, that is not familiar to the staff; thus, it will require more review time. Staff also stated that the evaluation of the containment seal may present a problem because scale model testing is not an NRC approved methodology for containment verification. Staff said that, because there is not enough assay data for SAS2H isotopics over a burnup of 45 GWD/MTU, it is difficult to do a trending analysis to extrapolate the benchmarks to burnups as high as 120 GWd/MTHM. For burnups above 45 GWD/MTU, several phenomena occur including hydride reorientation in the cladding material, absence of known mechanical properties and staff performs a criticality evaluation by assuming 100% breach of fuel rods and looking at the fuel pellets in broken pieces in all reconfigurations under the most reactive flooded conditions.

Staff advised NCS not to submit an application in the European format as initially envisioned but according to Regulatory Guide No. 7.9.

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TLI agreed with staff's suggestion for a second pre-application meeting to present more detailed information up-front due to the proposed tight review schedule. Staff suggested that TLI/NCS submits an application to NRC first followed by a DOT revalidation instead of the opposite, in view of the desired schedule. The staff did not make any regulatory commitments at the meeting.

Docket Nos. 71-9361, 71-9362

TAC No. LA0129

Enclosure 1: Meeting Attendees

Enclosure 2: Presentations by NCS

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Docket Nos. 71-9361, 71-9362  
TAC No. LA0129

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**Meeting Between TLI/NCS and the  
Nuclear Regulatory Commission  
June 2, 2011  
Meeting Attendees**

**NRC/NMSS/SFST**

Rob Temps	301-492-3320	<a href="mailto:robert.temps@nrc.gov">robert.temps@nrc.gov</a>
Jim Pearson	301-492-3337	<a href="mailto:jim.pearson@nrc.gov">jim.pearson@nrc.gov</a>
Neil Day	301-492-3335	<a href="mailto:neil.day@nrc.gov">neil.day@nrc.gov</a>
Pierre Saverot	301-492-3408	<a href="mailto:pierre.saverot@nrc.gov">pierre.saverot@nrc.gov</a>
Joe Borowsky	301-492-3063	<a href="mailto:joseph.borowsky@nrc.gov">joseph.borowsky@nrc.gov</a>
Craig Hrabal	301-492-3257	<a href="mailto:craig.hrabal@nrc.gov">craig.hrabal@nrc.gov</a>
Mike Call	301-492-3289	<a href="mailto:michel.call@nrc.gov">michel.call@nrc.gov</a>

**TLI**

Peter Vescovi	910-620-8679	<a href="mailto:pvescovi@tliusa.com">pvescovi@tliusa.com</a>
Norman Kent	803-738-5260	<a href="mailto:nkent@tliusa.com">nkent@tliusa.com</a>

**NCS**

Franz Hilbert	49-1-51-538-18-232	<a href="mailto:franz.hilbert@ncsg.de">franz.hilbert@ncsg.de</a>
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