

December 28, 2011

MEMORANDUM TO: Doug Weaver, Acting Director
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 NOVEMBER 30, 2011, MEETING WITH
TRANSNUCLEAR INC., REGARDING THE REQUEST FOR
ADDITIONAL INFORMATION FOR THE TN-LC PACKAGE

Background

Transnuclear Inc. (TN) submitted on June 7, 2011, an application for approval of the Model No. TN-LC package as a Type B(U)F-96 package. Staff performed an acceptance review of the application and, on July 26, 2011, advised TN that supplemental information was needed for staff to continue its review. On August 17, 2011, TN responded to the request for supplemental information. On November 22, 2011, staff sent a Request for Additional Information (RAI) and TN requested this meeting to present its technical approach for the resolution of the RAI.

Discussion

As indicated in the RAI letter dated November 22, 2011, staff said that several inconsistencies appeared to indicate that this application did not establish a clear understanding of the licensing basis of the package, in particular for high burnup fuel with zirconium cladding. Staff explained that criticality analyses considered bounding re-configured/damaged fuel geometries in hypothetical accident conditions (HAC), thus taking no credit for the structural integrity of the fuel, without addressing reconfigured shielding and thermal sources. Staff explained that this was contradictory with the statement that fuel assemblies will "maintain their structural integrity during accident conditions of transportation." Similarly, the structural integrity of the payload fuel assemblies and elements during normal conditions of transport (NCT) side and end drops were evaluated with "unknown" material properties for high burn up fuel cladding. Staff told TN that safety must be addressed in a defensible manner to satisfy regulatory limits.

TN presented a new licensing approach (see Enclosure 2) for both the NCT and HAC thermal, shielding, criticality and structural evaluations. Regarding compliance with 10 CFR 71.55(d)(2) which requires that the geometric form of the package contents is not substantially altered, TN explained that it will combine AREVA experience in transportation of commercial fuel in Europe with the current analyses of the fuel cladding and conservative properties on yield stress to make the case that the fuel remains intact during NCT. Operating procedures will also now include samples of the internal cavity to check for excess of fission gases.

Regarding the thermal evaluation, TN explained that failed fuel will shift the heat source to either the top or the bottom end of the confinement to bound the worst conditions under NCT, and that there is no need to know the geometry. The shielding evaluation shows that the NCT dose is

more limiting than the HAC dose and that shielding may have to be increased for a concentrated source. TN also advised staff that it will now use the TRITON code for shielding analyses and that benchmarks may change a little from those in the current application.

Staff explained that it is planning to accept the properties of research reactor fuel cladding because enough data is available. However, properties of fissile aluminum plate material sandwiched between the cladding or any contribution from that inner plate material are still questionable. Staff also explained that the properties of high burnup zirconium fuel cladding are unknown after drying and that it is concerned by the ductile to brittle transition temperature.

TN presented to staff preliminary responses to some of the RAIs. Staff said that TN cannot use the current analysis to qualify the impact limiter bolts. Staff explained that TN needs to (i) demonstrate that the bolts will not exceed their elongation limits upon the secondary impact of the tail impact limiter, and (ii) provide a corresponding stress analysis because staff was unable to duplicate TN's results for axial force, axial stress, axial strains and plastic strains. TN said that it will provide a rigorous attachment bolt evaluation, assuming failure of 50% of the bolts with the g load not being impacted, and that it will revise both the bolt assembly modeling and the sensitivity analysis.

The staff did not make any regulatory commitments at the meeting. TN committed to provide RAI responses, along with a revised application, by April 15, 2012.

Docket No. 71-9358
TAC No. L24543

Enclosure 1: Meeting Attendees
Enclosure 2: Major Technical Issues (proprietary, non-publicly available)

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Distribution: NRC Attendees:
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ADAMS Package No.: ML113620482

OFC	SFST	E	SFST	C	SFST
NAME	PSaverot		DDamiano for MDeBose		HAKhavannik for MWaters
DATE	12/28/2011		12/28/2011		12/28/2011

C=Without attachment/enclosure E=With attachment/enclosure N=No copy **OFFICIAL RECORD COPY**

**Meeting Between Transnuclear Inc.
and the
Nuclear Regulatory Commission
November 30, 2011
Meeting Attendees**

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