

June 6, 2013

MEMORANDUM TO: Anthony H. Hsia, Deputy 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 MAY 29, 2013, MEETING WITH  
TRANSNUCLEAR, INC.

### Background

Transnuclear, Inc. (TN) requested a pre-application meeting to discuss a planned amendment request for the Model No. TN-LC package. Proposed modifications include licensing drawings, welding and structural changes, as well as a change from a Criticality Safety Index (CSI) of 100 to 0 for TRIGA, NRUX, 1 Fuel Assembly (FA) Boiling Water Reactor (BWR) and 1FA pin can baskets.

The meeting was noticed on April 23, 2013. The meeting attendance list and the presentation slides are provided as Enclosure Nos. 1 and 2, respectively.

### Discussion

After Mark Lombard, Director of the Division of Spent Fuel Storage and Transportation, presented the common objectives to be reached by staff and an applicant, while stressing the importance of high quality submittals, TN discussed a few proposed design and structural changes due to early fabrication feedback of the Model No. TN-LC package. In particular, TN intends to replace the two inner and outer 3/4" groove welds on the trunnion attachment block by a 3/8" outer groove weld and a 3/8" inner fillet weld. TN stated that the weld bending stress under a 6g load would now become 20.9 ksi, compared to 13.5 ksi in the original application, for an allowable of 43.3 ksi. Staff expressed several concerns including the fact that the proposed design change in the trunnion weld joint has the potential to reduce the load weld strength by half, because of the reduction in the total weld metal. Staff also said that it would expect to see a complete "design change" justification in the submittal to demonstrate compliance with Title 10 of the *Code of Federal Regulations* 71.45(a). Another concern expressed by staff was related to the proposed change from a "Multilayer Liquid Penetrant Test (PT)" to a "Progressive PT": a 3/8" weld could be completed in two passes, i.e., root and cover, and staff would expect that the PT would also be done on the root and the cover. If the weld was done in three passes, staff would then expect that three PTs would be done.

Regarding other proposed changes, e.g., inaccurate item quantities such as for item 3J on 65200-71-01 (port plug) or for the inner spacer on the TRIGA basket, clarification of welding requirements for the NRUX basket ribs, correction of typos on the TRIGA basket drawing, and additional gap requirements for the materials testing reactor fuel buckets, TN said that such changes were made only to clarify "grey areas" and improve wording, and that there was no

change in the weld sizes, except for the trunnions, as indicated above. TN stated that they are still in the planning stages of procurement, with welding operations scheduled to take place in March 2014 (May 2014 for the NRUX basket) and for a package fabrication to be completed around November 2014. Staff expressed some surprise, when learning of the 100% dedication process for procurement activities, and said that this will be closely inspected and scrutinized.

The licensed criticality analysis is for a normal condition of transport array of three packages, resulting in a CSI of 100. TN is proposing to reduce the CSI to 0 for the TRIGA, NRUX, 1FA BWR, and 1 FA pin can baskets for cost and shipment scheduling reasons. TN presented its methodology (see Enclosure 2) for which staff had various initial reservations. TN said that the "neutron shield survives HAC" and staff asked if TN had performed a structural analysis for both the neutron shielding and the shell because the neutron shield blocks are not structurally resilient. Staff stated that it was wrong to take credit for the spacing while no structural analysis had been made for the neutron shell and that the spacing will not be maintained after a 30-ft drop. Regarding the statement "when credit is taken for spacing by the neutron shield," staff asked if TN will argue about any loss of shielding, after the puncture test, as a starting point of its evaluation and said that, even when just considering a puncture and a subsequent failure, it was wrong to assume that spacing stays the same since the neutron shielding is replaced by the moderator, i.e., water. Staff had the opinion that the premise of the model, as presented by TN, was that nothing happens to the package after the accident sequence, that the package appeared to be in a "pristine condition" and that TN did not incorporate any impact from hypothetical accident conditions assumptions.

Staff said that the very first step to take to ensure a proper review of such an amendment request is to (i) demonstrate the structural behavior of the package, e.g., how much plastic deformation there is after a 30-ft drop, and then (ii) evaluate, for TRIGA fuel, the consequences of puncture and the loss of neutron shielding in a subsequent fire, while looking at full moderator density. Staff also stated that there are more difficult issues to resolve for NRUX fuel because TN takes "credit for the neutron shield material which is modeled without hydrogen and boron," thus requiring TN to have materials testing done like that performed for Boron for the materials being credited in the neutron shield.

Staff said it always keeps an "open mind" when performing such technical reviews and encourages the applicant to take a conservative approach for the structural, puncture, and thermal evaluations. However, an applicant needs first and foremost a good and solid technical basis before submitting such amendment requests. Staff made no regulatory commitments during the meeting.

Docket No. 71-9358  
TAC No. L24740

Enclosure 1: Meeting Attendees  
Enclosure 2: Presentation

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Distribution: Attendees, M. Sampson

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**Meeting Between TN and the  
Nuclear Regulatory Commission  
May 29, 2013  
Meeting Attendees**

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