

November 25, 2014

MEMORANDUM TO: Anthony H. Hsia, Deputy Director  
Division of Spent Fuel Management, NMSS

FROM: Pierre Saverot, Project Manager /RA/  
Spent Fuel Licensing Branch  
Division of Spent Fuel Management, NMSS

SUBJECT: SUMMARY OF NOVEMBER 18, 2014, MEETING WITH  
ROBATEL TECHNOLOGIES, LLC

### Background

Robatel Technologies, LLC (Robatel) requested this pre-application meeting to present an approach to revise the current shielding evaluation and provide clarity in the operating and maintenance procedures of the Model No. RT-100 package. Robatel intends to submit an amendment request at the end of January 2015.

The list of attendees and Robatel's presentation are included as Enclosure Nos. 1 and 2, respectively.

### Discussion

One of the objectives of the pending amendment request is to reconcile the differences between Chapter Nos. 2, 3, and 5 of the application: the total displacement of the lead column has been calculated to be 1.62 mm from ANSYS end drop results in Section 2.7.1.1.2 of the application, while the lead slump has been calculated to be 24.78 mm, based on molten lead, in Section 5.3.1.3. Staff does recognize that the 24.78 mm lead slump was a conservative figure developed for the shielding model at a time the structural (end drop) and thermal (fire analysis) evaluations had not yet been completed, but staff is not totally convinced that the applicant can now retain the 1.62 mm figure, based on stress analysis, for this amendment request.

Staff said that it is difficult to imagine that there is no axial gap in the lead when Robatel is considering a radial gap in the calculations and that, since lead creep does not "happen overnight," the stresses due to lead shrinkage on the inner shell should be considered during both normal and accident conditions of transport. Staff believes that the 1.62 mm lead gap from the drop test appears to have been calculated without any consideration of the fabrication process (radial gap) and may be in reality too small because it also contradicts its own internal data that shows a 7% lead shrinkage rate. Staff said that lead expansion also induces an additional stress, e.g., in the bolts, that should be examined, and requested the stress-strain curve assumed for this lead, as well as any practical data on the lead incompressibility.

The applicant agreed that the current calculation does not include enough safety margins and that additional supporting analyses should be provided, e.g., evaluation of the gap between the steel shells and the lead shield due to thermal expansion, calculation of the compressive

stresses along the axial length of the shield during the end drop, consideration of potential air bubbles – small undetected voids creating more slumps - and gaps from the fabrication process.

The applicant did say that gaps, if any, are not due to the pouring process because the temperature is raised to 350°C, above the melting temperature, to allow the lead to fill all the voids. The applicant explained that it does not assume that the 0.68 mm calculated gap between the outer shell and the lead is filled with lead. The applicant will provide a gamma scan, as part of the acceptance tests, verifying that there is solid shielding from the top to the bottom of the package.

The proposed changes to the shielding evaluation of the Model No. RT-100 package show a “well behaved” model with new weight window files. Staff reminded the applicant that the weight window should be representative of a bounding case to ensure convergence. Staff asked if “forward calculations” will be performed instead of a “post-processing,” and the applicant responded that those will be done explicitly, with the results including all biases and uncertainties in the code. The loading table, included in Chapter 7, will also be revised.

Staff agreed with Robatel on the proposed changes for test personnel qualifications (there is no ASNT qualification per se; procedures and personnel are both qualified by a Level III), pre-shipment leakage test procedure and acceptance criteria if the revised application explicitly states, in Chapter Nos. 4, 7, and 8, that a Level III will approve the procedures for the leakage tests (including pressure change and the helium leakage tests). Staff also said that further clarifications in the application are needed to support the language of the proposed changes, e.g., “knowledgeable personnel” shall be replaced by “qualified personnel.”

Regarding a proposed change from “dewatered” to “grossly dewatered” resins, the applicant explained that the calculation is based on mechanical draining and that the free liquid amount is about 25.75% of the waste volume, i.e., 250 gallon of free water. The “gross dewatering” leads to a free liquid quantity close to 1% depending on the beads dimension (the smaller they are, the more water there is). Staff said that the industry “standard” for residual water is 1% and that it will verify if this figure is mentioned in a NUREG or if only the hydrogen concentration limit is stated.

Staff made no regulatory commitments during the meeting.

Docket No. 71-9365  
TAC No. L24900

Enclosure 1: Meeting Attendees  
Enclosure 2: Robatel Presentation

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Distribution: Attendees, M. Sampson  
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and 71-9365 Robatel\ November18 slides.pdf

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C=Without attachment/enclosure E=With attachment/enclosure N=No copy

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**Meeting Between ROBATEL and the  
Nuclear Regulatory Commission  
November 18, 2014  
Meeting Attendees**

**NRC/NMSS/SFM**

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