

June 25, 2014

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 JUNE 4, 2014, MEETING WITH THE U.S.  
DEPARTMENT OF ENERGY

#### Background

The U.S. Department of Energy (DOE) requested this pre-application meeting to present the information necessary for a technical evaluation of the West Valley melter as a package, with a demonstration of an equivalent level of safety to the one required by 10 CFR Part 71, in order to obtain a special authorization from NRC for shipment of the melter from the site.

The meeting attendance list and the presentation slides are provided as Enclosure Nos. 1 and 2, respectively.

#### Discussion

In 2004, the radiological content of the melter from its three source terms - (i) the 4" heel of diluted glass left in the last run, (ii) the plugged spout, and (iii) the "glaze" from the glass production runs due to glass migration into the refractory bricks - was estimated at 4,570 Ci, with a dose to Ci modeling point kernel calculation. There was no actual physical measurement of the heel, only an "educated estimate" of its activity. DOE is confident that the analysis of the data from glass sampling in the spout will now show an activity between 1,500 and 3,600 Ci.

Staff noted that (i) a proper characterization of the source terms is of utmost importance in this application, particularly for the determination of the package as fissile exempt, (ii) the difference between the 2004 and 2014 data, as presented, cannot be explained by decay heat, and (iii) the surface contamination numbers, obtained through modeling, will have to be justified since no samples were taken from the surface of the melter.

DOE stated that (i) the glass contains Pu-239, Pu-241, U-233, and U-235 with a bounding content of 176 grams from all three sources (heel, spout, glazing on refractory bricks), and (ii) the sources are connected, contiguous, and part of the matrix with a uniform distribution. The determination of the package as fissile exempt was made by using only the mass of the glass, not the mass of the melter. Staff said that DOE will have to (i) demonstrate that there is no other fissile material than the glass, and (ii) defend the accuracy of its data if the fissile exempt determination comes close to the 2000/1 ratio, as stated in the regulations.

Staff observed that general statements such as “the glass is a non-dispersible waste form, fixed and contained in the melter” will be challenged during staff’s review of the application. DOE needs to make the case that the glass stays intact, does not rubblize or shatter, and staff suggested to backup such arguments with both data from glass canister drop tests and glass performance modeling to evaluate the fraction that can be released under hypothetical accident conditions (HAC).

DOE believes the shielding evaluation should not be challenging because the concrete prevents both migration of any remaining surface contamination and dose rate changes during transportation. Staff replied that DOE will have to consider loss of confinement and the presence of cracks in the concrete under HAC. Staff said that, even though the melter was grouted to fill all void spaces, it will not be possible to demonstrate that a complete confinement can be maintained under HAC which is a main concern for release fractions in a containment evaluation, and that DOE should assume that all sources are presumably available for release in its demonstration of compliance with 10 CFR 71.51. Staff requested published material on the performance of shattered or cracked low density concrete after an impact.

The ongoing structural assessment of the package, which has a bolted cover, shows that a 30-ft drop results in 100% bolt failure under HAC and also under selected normal conditions of transport (NCT) drops. Staff asked questions about the basis for the model, its benchmarking, and if there was any shearing of the cover plate during a puncture test. Staff said that the model shall be run with no bolts to give some level of confidence and that the review will not focus on the detailed behavior of “sacrificial” bolts but on energy dissipation. Staff asked if contact friction, and the interface between the grout and the steel cover plate, were considered in the current structural assessment, and if any sensitivity analysis had been performed.

Regarding the thermal evaluation, staff agreed with DOE on the development of gaps in the bolted closure near the point of impact during the drop tests and said that DOE shall use the NCT steady-state temperatures (with insolation) as the initial temperatures of the package for the HAC thermal analysis.

DOT expressed its surprise at the mention of “DOT shipment” since there is no DOT certified package, DOE having only “self-certified” the melter as an IP-2 package. Thus, DOT requested DOE to refrain from using the terms of “DOT package” or “DOT shipment.” DOT also said that it is potentially possible that no DOT special permit may be needed if its final rule is finalized in the Fall of 2014. DOT confirmed that an application is usually reviewed in 30 to 45 days.

DOE is planning a mid-October 2014 submittal for a shipment in FY 2015. Staff suggested a second pre-application meeting focused on the containment and structural evaluations of the package. Staff made no regulatory commitments during the meeting.

Docket No. 71-9797

TAC No. L24918

Enclosure 1: Meeting Attendees

Enclosure 2: Presentation

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Distribution: Attendees, M. Lombard, M. Sampson

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**ADAMS Accession No.: ML14176A155**

**ADAMS P8 Package No.: ML14176A158**

<u>Distribution:</u> NRC	SFST	E	SFST	C	SFST			
<b>NAME</b>	PSaverot		MDeBose		TLupold			
<b>DATE</b>	06/10/2014		06/17/14		6/25/14			

**Meeting Between DOE and the  
Nuclear Regulatory Commission  
June 4, 2014  
Meeting Attendees**

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