April 11, 2007

MEMORANDUM TO: William H. Ruland, Deputy Director
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

FROM: Meraj Rahimi, Senior Project Manager /RA/
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF MARCH 29, 2007, MEETING WITH PACTEC ON TRUPACT-III PACKAGE (DOCKET NO. 71-9305, TAC NO. L23827)

On March 29, 2007, the Nuclear Regulatory Commission (NRC) staff and the Packaging Technology (PacTec) representatives held a pre-application meeting to discuss the results of the full-scale model drop tests for the redesigned TRUPACT-III transportation package. An attendance list is provided in Enclosure 1. Enclosure 2 includes the handouts provided at the meeting.

The redesigned TRUPACT-III package is a shorter package which can be transported within a legal weight highway shipments limit. The package is rectangular in shape and is the size of a 14 foot ISO container (14 ft x 8.2 ft x 8.7 ft). The package provides a single containment system that is designed to transport oversized boxes of contact-handled transuranic waste materials consisting of solid and solidified materials (similar to the TRUPACT-II, Certificate of Compliance No. 71-9218). Two stainless steel thin (i.e., 8 mm) walls with 4 mm stiffeners in between are used for the construction of the containment vessel.

PacTec presented the results of certification tests which were performed on a full-scale model of the TRUPACT-III package. Drop tests in five different orientations and puncture tests in four different orientations were performed. A vacuum test was performed after each drop to determine the overall status of the containment with a leak rate test after all the drops and the puncture tests to indicate the leaktightness of the package. After the last drop, which was the center-of-gravity over the closure corner drop test, the test unit did not pass the vacuum test. The puncture tests were then performed and the subsequent helium leak test of the closure lid containment O-ring seal indicated loss of containment. Upon removal of the closure lid, it was discovered that both the containment and the O-ring seals were contaminated with debris from the simulated payload. In addition, a number of bolts had been bent which resulted in reduction of their torques. When the seals, flange, and the closure lid were cleaned from the debris and put together with the 44 closure bolts tightened to only 110 ft-lb, which is less than 10% of the standard torque of 1,190 ft-lb, the unit passed the leak test. PacTec indicated that the re-assembled closure lid with only the four corners bolts tightened to about 110 ft-lb also passes the leak test. PacTec's conclusion is that "the debris, (not structural inadequacy of the closure, such as low bolt torque, bent bolts, etc.) was sole cause of post-test leakage rate test failure." Therefore, PacTec has proposed to modify the design of TRUPACT-III to add a debris shield. No further full-scale tests with the debris shield are planned.

The staff questioned the plastic deformation of the bolts, and reminded PacTec about the no-yield-in-bolts criterion (i.e., NUREG/CR-6007). PacTec believes despite of bolts bending, the minimum torque required among the 44 bolts to pass the leakage rate is more than adequate. The staff indicated that reduction in the clearance between the lid shear lip and the flange may eliminate the bolts bending. The staff believes no decisions can be made at this point until the application is submitted, and the staff can determine if there are any correlations between the bent bolts and the bolts which had not retained their initial torques. The staff also questioned PacTec on the demonstration of the debris shield without any full-scale tests. PacTec indicated that their plan is to demonstrate by analysis and some kind of physical tests but not the full-scale drop tests. The staff indicated that further feedback will be provided if needed. PacTec also presented two additional changes which include switching to hardened closure bolt washers to further resist lowering of preload torque under Hypothetical Accident Condition drops and improving root-welding technique to eliminate weld tearing of external overpack shields. PacTec is planning to submit the Safety Analysis Report for the redesigned TRUPACT-III including the additional design modifications in May 2007.

No regulatory decisions were made at the meeting.

Docket No. 71-9305
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Enclosures:
1. Attendance List
2. Meeting Handout

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DATE:	4/3 /07		4/3 /07		4/11 /07	

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Meeting Between PacTec and the Nuclear Regulatory Commission Staff
March 29, 2007

ATTENDANCE LIST

Name	Affiliation
Meraj Rahimi	NRC/NMSS/SFST
Bob Tripathi	NRC/NMSS/SFST
David Tang	NRC/NMSS/SFST
Larry Campbell	NRC/NMSS/SFST
Earl Easton	NRC/NMSS/SFST
Andrew Barto	NRC/NMSS/SFST
Gordon Bjorkman	NRC/NMSS/SFST
Nancy Osgood	NRC/NMSS/SFST
Jerry Chuang	NRC/NMSS/SFST
Zahira Cruz Perez	NRC/NMSS/SFST
Natreon Jordan	NRC/NMSS/SFST
John Wray	NRC/NMSS/SFST
Ron Parkhill	NRC/NMSS/SFST
Gary Clark	PacTec
Marc Italian	US DOE/CBFO
Robert Johnson	Washington TRU Solutions
Todd Sellmer	Washington TRU Solutions

Enclosure 1

Enclosure 2