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TRU Solutions LLC

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Ms. K. Hardin, Senior Project Manager
NMSS/SFPO MS/013D13
U.S. Nuclear Regulatory Commission
One White Flint North
15555 Rockville Pike
Rockville, MD 20852-2738

Subject: TELECONFERENCE SUMMARY AND CLARIFICATION REGARDING THE
VERIFICATION OF THE ANALYTICAL SHIPPING CATEGORY BASED ON
EXISTING SHIPMENT DATA

- References:
1. TAC Nos. L24217 and L24218
 2. Letter from T. E. Sellmer to M. Rahimi dated April 14, 2008, subject:
Response to Request for Additional Information for Review of an Application
for Revision 22 of the TRUPACT-II Shipping Package Application (Docket
No. 71-9218, TAC No. L24110) and Revision 5 of the HalfPACT Shipping
Package Application (Docket No.71-9279, TAC No. L24111)
 3. Letter from K. Hardin to T. E. Sellmer dated November 26, 2008, subject:
Request for Additional Information for Review of the Certificates of
Compliance No. 9218 and 9279, Revision for the Model Nos. TRUPACT-II
and HalfPACT Packages

Dear Ms. Hardin:

This letter is provided to summarize the recent telephone-conference call on 12/03/08 between members of your staff, the U.S. Department of Energy Carlsbad Field Office (DOE-CBFO), and Washington TRU Solutions LLC (WTS) held to clarify information originally provided in response to the NRC RAI question CH-2 (Reference 2) that resulted in the additional NRC RAI question CH-1 (Reference 3).

NRC RAI question CH-2 required WTS to perform a validation of the analytical shipping category for Waste Types I, II, and III based on existing shipment data. The requested objective was to verify the consistency between the analytical and measurement flammable gas generation compliance methodologies, each described in Section 5 of the currently approved CH-TRAMPAC, by evaluating containers shipped under the analytical category against the flammable gas concentration limit determined through the measurement methodology.

Per the currently approved CH-TRAMPAC, the following methods are authorized for demonstrating compliance with the 5% hydrogen concentration limit:

- Analytical category, in which compliance with the 5% hydrogen concentration limit is ensured by compliance with a decay heat limit

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- Hydrogen headspace measurement under the test category, in which compliance with the 5% hydrogen concentration limit is ensured by compliance with a flammable gas generation rate (FGGR) limit. In this method, a shipping site uses the drum headspace measurement results as input to the AltMeth model that predicts the hydrogen concentration in the drum innermost layer of confinement.

Both compliance methods are independent and valid methods for determining compliance with the 5% hydrogen concentration limit. Contrasting the limit calculation and compliance evaluation for each generally differentiates the two methods, as follows:

Limit Calculation

The hydrogen headspace measurement method imposes an FGGR limit, which is calculated based on the following parameters:

- Waste packaging configuration (release rate of hydrogen from each confinement layer)
- Void volume in the ICV outside the payload containers available for gas accumulation
- Duration of shipping period.

The analytical category method imposes a decay heat limit, which is calculated using the same FGGR limit (as the hydrogen headspace measurement method) in combination with the G value (gas generation potential) of the bounding waste material.

Compliance Evaluation

Under the hydrogen headspace measurement method, compliance with the FGGR limit is evaluated against an FGGR value that correlates to the innermost hydrogen concentration value calculated by the AltMeth model using (1) a container headspace hydrogen concentration measurement value, (2) the time history of container (dates of container generation, venting, and headspace sampling), and (3) the release rates of the confinement layers.

Under the analytical category method, compliance with the decay heat limit is evaluated against a decay heat value that consists of an assay measurement plus the measurement error.

As discussed on the 12/03/08 conference call, a strict correlation between the analytical category method and the hydrogen headspace measurement method does not exist because each method uses independent assumptions that are conservative with respect to the 5% hydrogen concentration limit. Because the methodology and conservatisms of each method are independent, both methods are separate and valid methods for determining compliance with the 5% hydrogen concentration limit. The two methods use different methodologies based on independent assumptions that have been demonstrated by years of empirical data to be conservative with respect to ensuring compliance with the 5% hydrogen concentration limit.

The requested validation analysis was performed using a simplified application of the AltMeth model on a population of 9,665 drums. As detailed in the response to RAI question CH-2 (Reference 2), the results of this analysis reflected that 96% of the drums have measured

headspace hydrogen concentration values for which AltMeth predicts FGGR values that comply with FGGR limits for the applicable payload shipping categories. The drums in the remaining 4% comply with the 5% hydrogen concentration limit, but due to the limitations of the headspace gas data originally gathered for purposes other than assessing compliance with the measurement method, they did not coincide with the other 96% of the drums in the population for one or more of the four reasons discussed in the CH-2 RAI response (Reference 2). As a point of clarification, it should be noted that the four reasons discussed in the CH-2 RAI response were not used at the time of shipment to qualify the drums belonging to the 4% population. These reasons were identified after performance of the requested validation analysis to summarize limitations in the drum data set that compromised the ability to validate the two independent flammable gas compliance methods against one another. There is no compliance issue with respect to the 5% hydrogen concentration limit for the 4% population. For example, a significant portion of the 4% inventory showed zero hydrogen upon measurement. The FGGR rate reflected in the analysis is purely a function of the Method Detection Limit (MDL) that was used in the analysis in place of a zero value. With respect to compliance with the 5% hydrogen limit, no measured hydrogen in the headspace is the best possible result. It is also noted that evaluations are currently being performed to respond to the additional questions posed in the CH-1 RAI question (Reference 3).

WTS is confident that all of the drums in the 4% population met the analytical category decay heat limits for the assigned payload shipping categories and none exceeded the 5% hydrogen concentration limit. Further, all drums that have been authorized for transport within the TRUPACT-II and HalfPACT under both the analytical and measurement methodologies are fully compliant with the requirements of the TRUPACT-II and HalfPACT Certificates of Compliance and the regulatory guidance restricting the hydrogen concentration in the innermost confinement layer to less than or equal to 5%. The current safety basis for both the TRUPACT-II and the HalfPACT continues to be robust, and the flammable gas compliance methodologies ensure that payloads are authorized in a manner that continues to protect the public and comply with all of the applicable requirements listed in Title 10 CFR Part 71.

If you have any questions or require additional information, please contact me at (505) 234-7396.

Sincerely,



T. E. Sellmer, Manager
Packaging Integration

TES:clm

cc: M. Brown, CBFO
D. Gadbury, CBFO