



Washington TRU Solutions LLC

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January 26, 2012

ATTN: Document Control Desk  
Director, Spent Fuel Project Office  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: REPORT PURSUANT TO 10 CFR 71.95

Dear Ms. Rankin:

Washington TRU Solutions LLC, on behalf of the U.S. Department of Energy Carlsbad Field Office, submits this letter to report a condition pursuant to 10 CFR 71.95 regarding the use of Transuranic Package Transporter (TRUPACT-II) Model Numbers 197, 184, 138, 126, 137, 173, and 166. These packagings operate under the U.S. Nuclear Regulatory Commission Certificate of Compliance (CofC) No. 9218. During shipments of transuranic (TRU) waste to the Waste Isolation Pilot Plant (WIPP) originating from the Savannah River Site (SRS) and Los Alamos National Laboratory (LANL), the conditions in Section 11.(a) of CofC No. 9218 were not followed in their entirety.

Following is a description of the event, reported in accordance with 10 CFR 71.95(c):

*(1) A brief abstract describing the major occurrences during the event, including all component or system failures that contributed to the event and significant corrective action taken or planned to prevent recurrence:*

CofC 9218 specifies, "For Content Code...SQ 154, compliance with the gas generation requirements must be in accordance with Appendix 6.12 of the CH-TRU Payload Appendices." During a review of past shipments under Content Code SQ 154D in the Waste Data System (WDS), 13 previously shipped drums (8 from SRS and 5 from LANL) were noted as having filters that did not meet the minimum hydrogen diffusivity requirements specified for SQ 154D in CH-TRU Payload Appendix 6.12. The 13 drums were part of seven TRU waste shipments shipped to the WIPP in New Mexico. Other containers in the shipments were configured compliantly.

There were no major occurrences during the event and no component or system failures that contributed to the event. However, due to the installation of filters with less than the minimum

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hydrogen diffusivity specified, the conditions in CofC 9218 were not followed in their entirety resulting in these shipments traveling to the WIPP in a non-compliant condition.

An evaluation with regard to payload parameters using the approved CH-TRAMPAC methodology showed that the containers were shipped in compliance with the applicable gas generation rate limits and met all other payload limits for transport in the TRUPACT-II. While no limits were exceeded, the containers were not shipped in compliance with the description for Content Code SQ 154 in CH-TRU Payload Appendix 6.12 with regard to the filter diffusivity on the drums.

The following corrective/preventive actions were implemented to preclude recurrence:

- The WDS (Waste Data System) reference table values were updated to automatically check for the proper diffusivity of containers assigned to Content Code SQ 154D.
- The personnel involved were notified of the discrepancy in order to avoid recurrence and additional training has been conducted.

*(2) A clear, specific, narrative description of the event that occurred so that knowledgeable readers conversant with the requirements of part 71, but not familiar with the design of the packaging, can understand the complete event. The narrative description must include the following specific information as appropriate for the particular event:*

The NRC CofC 9218, Revision 20, issued for the TRUPACT-II states in Section 11.(a), "For content code LA 154 and SQ 154 payloads, each package must be prepared for shipment and operated in accordance with the procedures described in Chapter 7.0 of the application, as modified by Appendix 6.12 of CH-TRU Payload Appendices." As described in the Additional Criteria subsection of Section 6.12.10, Content Codes, of CH-TRU Payload Appendix 6.12 for SQ 154D, "The 55-gallon drum is filtered with a minimum total filter diffusivity of 1.85E-5 moles per second per mole fraction."

The following non-compliant containers were vented with a filter with a minimum hydrogen diffusivity of 3.7E-6 moles per second per mole fraction instead of the required 1.85E-5 moles per second per mole fraction:

Date / Time Shipped (MST)	Shipment No.	TRUPACT-II No.	Payload ID Number	Container ID Number
4-26-2008 / 15:00	LA080036	138	LA0923	LA00000080116 LA00000080132 LA00000080199 LA00000080328
7-23-2008 / 17:42	SR080075	197	A0695	HBL070067 HBL070068 HBL070070
2-12-2009 / 16:30	SR090012	126	A0771	SR502007
8-19-2009 / 18:00	LA090077	184	LA1207	LA00000062696
4-21-2010 / 07:30	SR100036	173	SR1100	SR503578
4-23-2010 / 17:15	SR100037	137	SR1103	SR503521
11-18-2010 / 18:22	SR100070	166	SR1202	SR503710 SR519002

All other conditions required for the operation and shipment of the packages in accordance with the CofC were adhered to. An independent evaluation of the shipments and container gas generation properties determined that all applicable CH-TRAMPAC limits were met given the low decay heat, low measured hydrogen, shipping durations, and packaging configurations of the containers.

*(2)(i) Status of components or systems that were inoperable at the start of the event and that contributed to the event;*

This criterion is not applicable to the event because there were no components or systems that were inoperable at the start of the event.

*(2)(ii) Dates and approximate times of occurrences;*

See table above for shipment dates and approximate times.

*(2)(iii) The cause of each component or system failure or personnel error, if known;*

No components or systems failed. Personnel failed to ensure that filters with the required minimum hydrogen diffusivity for the content code (SQ 154D) were installed on these containers prior to shipment.

*(2)(iv) The failure mode, mechanism, and effect of each failed component, if known:*

This criterion is not applicable to the event because no components failed.

*(2)(v) A list of systems or secondary functions that were also affected for failures of components with multiple functions;*

This criterion is not applicable to the event because no components failed.

*(2)(vi) The method of discovery of each component or system failure or procedural error;*

The incorrect filter configuration was originally discovered by WIPP personnel after a routine WDS shipment evaluation, on November 19, 2010, that identified a payload from SRS, Shipment Number SR100070, with two 55-gallon drums fitted with a filter with a lower hydrogen diffusivity than required for Content Code SQ 154D. The issue was discovered after shipment occurred, but an evaluation showed compliance with all gas generation requirements of the CH-TRAMPAC and that the SQ 154D content code assignment for the containers was conservative. This led to an erroneous determination that the conditions were acceptable.

Following that discovery, weekly pre-shipment reviews by cognizant payload engineers of containers certified for SQ 154 shipments were implemented. The weekly reviews have prevented additional SQ 154 shipments with incorrect filter configurations since November 2010.

As part of the weekly SQ 154 reviews, a similar configuration was discovered on October 18, 2011, that identified a payload from SRS with one 55-gallon drum fitted with a filter with a lower hydrogen diffusivity than required for Content Code SQ 154D. The issue was discovered before shipment occurred and was remediated, establishing compliance with the TRUPACT-II CofC, and then later shipped. Following the condition identified during this pre-shipment evaluation, the required extent of condition evaluation led to the discovery of the 13 drums listed in the table above on October 19, 2011. This evaluation included a re-evaluation of the previous CofC compliance determination for the two SRS drums identified in November 2010. The extent of condition evaluation concluded on November 30, 2011, and it was determined that all 13 drums, including the two in Shipment Number SR100070, were not in compliance with the TRUPACT-II CofC because they were not shipped in compliance with the description for Content Code SQ 154D in CH-TRU Payload Appendix 6.12 with regard to the filter diffusivity on the drums.

*(2)(vii) For each human performance-related root cause, a discussion of the cause(s) and circumstances;*

Personnel failed to ensure that filters with the required minimum hydrogen diffusivity for the content code (SQ 154D) were installed on these containers prior to shipment.

*(2)(viii) The manufacturer and model number (or other identification) of each component that failed during the event; and*

Manufacturer and model numbers associated with component failure are not applicable because no components failed.

*(2)(ix) For events occurring during use of a packaging, the quantities and chemical and physical form(s) of the package contents.*

Payload ID LA0923:

Radionuclides: \_\_\_\_\_

Table Withheld Under 10 CFR 2.390

**Physical and Chemical Form:**

<u>Description</u>	<u>Weight (kg)</u>
IRON BASE METAL ALLOYS	253
OTHER METAL/ALLOYS	0.6
OTHER INORGANIC MATERIALS	9.4
CELLULOSICS	43.6
RUBBER	136.8
PLASTICS	76.8
STEEL CONTAINER MATERIALS	580.6
<u>Total</u>	<u>1100.8</u>

**Payload ID LA1207:****Radionuclides:**

Table Withheld Under 10 CFR 2.390

## Physical and Chemical Form:

Description	Weight (kg)
IRON BASE METAL ALLOYS	162.10
OTHER INORGANIC MATERIALS	40.70
CELLULOSICS	12.10
RUBBER	112.80
PLASTICS	35.70
STEEL CONTAINER MATERIALS	290.30
Total	653.70

Rayload ID A0695:

## Radionuclides:

Table Withheld Under 10 CFR 2.390

**Physical and Chemical Form:**

Description	Weight (kg)
IRON BASE METAL ALLOYS	292.3
ALUMINUM BASE METAL/ALLOYS	29.4
OTHER METAL/ALLOYS	0.2
OTHER INORGANIC MATERIALS	6.7
CELLULOSES	13
RUBBER	32.6
PLASTICS	65.3
STEEL CONTAINER MATERIALS	580.6
Total	1020.1

Payload ID A0771:

Radionuclides:

Table Withheld Under 10 CFR 2.390

Physical and Chemical Form:

Description	Weight (kg)
IRON BASE METAL ALLOYS	303.9
ALUMINUM BASE METAL/ALLOYS	5
OTHER INORGANIC MATERIALS	24.5
CELLULOSES	5.1
RUBBER	101
PLASTICS	224
STEEL CONTAINER MATERIALS	580.6
Total	1244.1

Payload ID SR1100:

Radionuclides:

Table Withheld Under 10 CFR 2.390

Physical and Chemical Form:

Description	Weight (kg)
IRON BASE METAL ALLOYS	168.80
OTHER INORGANIC MATERIALS	7.50
CELLULOSICS	4.50
RUBBER	16.10
PLASTICS	83.30
STEEL CONTAINER MATERIALS	290.30
Total	570.50

Payload ID SR1103:

Radionuclides:

Table Withheld Under 10 CFR 2.390

## Physical and Chemical Form:

Description	Weight (kg)
IRON BASE METAL ALLOYS	119.80
ALUMINUM BASE METAL/ALLOYS	0.10
OTHER INORGANIC MATERIALS	5.50
CELLULOSICS	2.90
RUBBER	17.90
PLASTICS	69.80
STEEL CONTAINER MATERIALS	318.90
Total	534.90

Payload ID SB1202:

Radionuclides:

Table Withheld Under 10 CFR 2.390

## Physical and Chemical Form:

Description	Weight (kg)
IRON BASE METAL ALLOYS	269.3
OTHER METAL/ALLOYS	10
OTHER INORGANIC MATERIALS	15
CELLULOSICS	18.2
RUBBER	2.6
PLASTICS	73.6
STEEL CONTAINER MATERIALS	666.4
Total	1055.1

*(3) An assessment of the safety consequences and implications of the event. This assessment must include the availability of other systems or components that could have performed the same function as the components and systems that failed during the event.*

There were no systems or components that failed during the event. There were no safety consequences or implications of the event.

*(4) A description of any corrective actions planned as a result of the event, including the means employed to repair any defects, and actions taken to reduce the probability of similar events occurring in the future.*

- The WDS reference table values have been updated to check for the proper filter hydrogen diffusivity of containers assigned to Content Code SQ 154D. This check will ensure that the software rejects payloads/containers assembled in a non-compliant state prior to physically assembling the actual payload.
- Applicable personnel have received training regarding the SQ 154 code requirements to help prevent recurrence.

There were no defects requiring repair associated with this event.

*(5) Reference to any previous similar events involving the same packaging that are known to the licensee or certificate holder.*

No similar previous events to reference.

*6) The name and telephone number of a person within the licensee's organization who is knowledgeable about the event and can provide additional information.*

T.E. Sellmer, Manager, WTS, RCT, Packaging Integration (575) 234-7396  
D.K. Ploetz, Manager, WTS, RCT (575) 234-7125.

*(7) The extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.*

There were no exposures to individuals as a result of the event.

If you have any questions or require additional information regarding this report, please contact me at (575) 234-7396.

Sincerely,



T. E. Sellmer, Manager  
Packaging Integration

ML:jmc

cc: M. R. Brown, CBFO  
G. Hellstrom, CBFO  
J. C. Rhoades, CBFO  
R. Unger, CBFO  
J. Rankin, NRC