



A URS-led partnership with B&W and AREVA

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June 17, 2013

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. Akhavannik:

Nuclear Waste Partnership (NWP) 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 the Type B packaging model number TRUPACT-II, serial numbers 167, 172, and 196. 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 Los Alamos National Laboratory (LANL), the conditions in Section 7 and 8 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 a payload made up of payload containers with different shipping categories, the flammability index of each payload container must not exceed 50,000 in accordance with CH-TRAMPAC, Rev.3, Section 6.2.4..." An error was discovered in the Waste Data System (WDS) software, which automates CH-TRAMPAC compliance. This error resulted in the incorrect calculation of the flammability index (FI) for some 12-inch Standard Pipe Overpack (POC) payload containers. The error was introduced in early 2008 as part of a software revision intended to update a portion of the software unrelated to POCs. During a review of past shipments in the WDS from January 2008 to present, 3 previously shipped POCs were identified as having been impacted by this software error. The 3 POCs were part of two TRU waste shipments shipped to the WIPP in New Mexico. Other containers in the shipments were evaluated compliantly and correctly by the software.

There were no major occurrences during the event and no component or system failures that contributed to the event. An evaluation with regard to payload parameters using the approved

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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. However, due to the error in the WDS software, the conditions in CofC 9218 were not followed in their entirety for these 2 shipments.

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

- All pending shipments containing POCs were suspended until the software was corrected and tested for compliance.
- The WDS mixed category evaluation logic for the POC was corrected to calculate the FI in accordance with CH-TRU Payload Appendix 2.4.
- Validation testing on the WDS software revision was performed to ensure that the software was performing the FI calculations for POC payloads in accordance with CH-TRU Payload Appendix 2.4

A POC -specific test case was added to the set of payload test cases developed and utilized used to validate WDS software revisions.

(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 7, "For a payload made up of payload containers with different shipping categories, the flammability index of each payload container must not exceed 50,000 in accordance with CH-TRAMPAC, Rev.3, Section 6.2.4..." CH-TRAMPAC Section 6.2.4, *Mixing of Shipping Categories*, refers to CH-TRU Payload Appendix 2.4 for the logic and methodology of calculating flammable gas/VOC concentration limits and determining FI. CH-TRU Payload Appendix 2.4.1.1 defines $r_{eff,i}$ as the "effective resistance to the release of hydrogen of payload container "i" (sec/mole)." The software error incorrectly ignored the hydrogen release resistance of the filter vent installed on the 55-gallon drum of the POC assembly in calculating the Allowable Flammable Gas Generation Rate (AFGGR) whenever the mixed shipping category evaluation was being used to evaluate the FI. The AFGGR was calculated correctly in all cases at the payload container level (mixed shipping categories not used). A payload container that does not pass the individual payload container shipping category limits (which were calculated correctly in all cases) is evaluated by the WDS software using the mixed category evaluation for compliance.

The mixed category compliance evaluation was used for the following POCs that did not meet individual shipping category limits between January 2008 and present:

Date / Time Shipped (MST)	Shipment No.	TRUPACT-II No.	Payload ID Number	Container ID Number
10-20-2011 / 15:15	LA110147	167	LA2263	LA00000088744
9-8-2011 / 17:05	LA110118	172	LA2178	LA00000089144
		196	LA2179	LA00000089115

Although these three payload containers used the erroneous mixed shipping category evaluation, an independent CH-TRAMPAC evaluation was performed and shows that all three payload containers are compliant. Programmatic conservatism in the assignment of a conservative shipping category and sample location makes up for the error in the software.

All other conditions required for the operation and shipment of the packages in accordance with the CofC were adhered to.

(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, systems, or personnel failed.

(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 software error was identified while performing testing for an impending software revision. While testing the compliance checks for this revision, the error was discovered. An extent of condition evaluation identified the 2 shipments impacted by the software error.

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

No human related errors occurred.

(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 LA2263:

Radionuclides:

Table Withheld Under 10 CFR 2.390

Physical and Chemical Form:

<u>Material Category</u>	<u>Material Type</u>	<u>Weight (lbs)</u>
Waste	Metallic	96.14
	Inorganic	142.44
	Organic	18.74
Payload Materials	Metallic	3,375.63
	Inorganic	191.39
	Cellulosic	836.58
	<u>Total</u>	<u>4,660.93</u>

Payload ID LA2178:

Radionuclides:

Table Withheld Under 10 CFR 2.390

Physical and Chemical Form:

<u>Material Category</u>	<u>Material Type</u>	<u>Weight (lbs)</u>
Waste	Metallic	30.43
	Inorganic	97.68
	Organic	37.49
Payload Materials	Metallic	3,364.83
	Inorganic	191.39
	Cellulosic	848.93
	Total	4,570.74

Payload ID LA2179:

Radionuclides:

Table Withheld Under 10 CFR 2.390

Physical and Chemical Form:

Material Category	Material Type	Weight (lbs)
Waste	Metallic	31.75
	Inorganic	63.06
	Organic	25.14
Payload Materials	Metallic	3,187.55
	Inorganic	177.72
	Cellulosic	788.29
Total		4,273.51

(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 software testing program will be expanded to include additional testing and validation that will be utilized prior to release of the software to evaluate both new software changes and impacts to previously implemented software logic.

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.

Washington TRU Solution letter number PK:07:00009, dated 3/21/2007:
Incorrect hydrogen/methane concentration evaluation was caused by an electronic database programming error.

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, NWP, Central Characterization Program (CCP), Transportation Packaging (575) 234-7396
C.A. Chester, Manager, NWP, WDS & CCP Engineering (575) 234-7134

(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
Transportation Packaging

ML:jmc

cc: M. R. Brown, CBFO
G. Hellstrom, CBFO
D. Miehl, CBFO
J. C. Rhoades, CBFO
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