Enclosure 1 - CCP-AK-INL-004, Table 5-2 (1 page)

Table 5-2. Isotopic Compositions of Rocky Flats Plutonium and Uranium

Weapons-Grade Plutonium		Enriched Uranium		Depleted Uranium	
Plutonium-238	0.01 – 0.05%	Uranium-234	0.1 – 1.02%	Uranium-234	0.0006%
Plutonium-239	92.8 – 94.4%	Uranium-235	90 – 94%	Uranium-235	0.2 – 0.3%
Plutonium-240	4.85 – 6.5%	Uranium-236	0.4 – 0.5%	Uranium-238	99.7 – 99.8%
Plutonium-241*	0.3 – 1.0%	Uranium-238	5.3 – 5.5%		
Plutonium-242	0.005 – 0.60%				

* includes americium-241 daughter product

Enclosure 2 - Review of the Certified Assay Data of 136 drums in Waste Stream ID-RF-S5300-A (1 page)

Enclosure 2

An analysis of 136 drums from the same time frame and process, which have been characterized to date, has been conducted. The results of the analysis are as follows:

Radiouuclide/Calculation	Average	Range	
		Low	High
AM-241 (g)	1.11E-04	0.00E+00	2.64E-03
CS-137 (g)	6.07E-12	0.00E+00	2.95E-10
NP-237 (g)	1.60E-05	0.00E+00	2.61E-04
PU-238 (g)	6.45E-06	0.00E+00	2.13E-04
PU-239 (g)	5.21E-02	0.00E+00	1.46E+00
PU-240 (g)	3.09E-03	0.00E+00	9.33E-02
PU-241 (g)	4.77E-05	0.00E+00	1.25E-03
PU-242 (g)	1.54E-05	0.00E+00	4.12E-04
RA-226 (g)	1.53E-09	0.00E+00	1.65E-07
SR-90 (g)	4.25E-12	0.00E+00	2.06E-10
U-232 (g)	4.48E-12	0.00E+00	6.09E-10
U-233 (g)	0.00E+00	0.00E+00	0.00E+00
U-234 (g)	0.00E+00	0.00E+00	0.00E+00
U-235 (g)	0.00E+00	0.00E+00	0.00E+00
U-238 (g)	0.00E+00	0.00E+00	0.00E+00
Plutonium Equivalent Curies (Ci)	4.57E-03	0.00E+00	1.28E-01
Plutonium Fissile Gram Equivalents (g)	5.23E-02	0.00E+00	1.47E+00
TRU Alpha Activity Concentration nCi/g	8.78E+01	0.00E+00	2.46E+03

Enclosure 3 - Corrective Action Report (CAR) number 28920 (3 pages)

CORRECTIVE ACTION REPORT

CAR #: 28920

PARENT:

Title: Incorrect Drum Shipped to Waste Isolation Pilot Plant

Category: WIPP Data	**Date Opened:** 7/18/2007 2:03:00PM
Originator: Dumas, Elvin	**ORPS Reportable:** Yes
Source Type: As Found Condition	**ORPS No.:** EM-ID--BBWI-AMWTF-2007-0013
Source Type Doc. No. : N/A	**ORPS Category:** 3

Requirement Violated: MP-TRUW-8.1; MP-TRUW-8.2; MP-TRUW-8.3

Finding #:

Description of CAR: On 7/16/2007, personnel at the Advanced Mixed Waste Treatment Project (AMWTP) discovered that a shipment of Transuranic Waste (TRU) made on June 23, 2007 to the Waste Isolation Pilot Plant (WIPP) had contained a drum which was not approved to be shipped. This container was shipped in TRUPACT- II cask serial number 190, in shipment IN070356. This condition caused non-compliances with WIPP Program requirements. Therefore, this event was categorized as reportable under ORPS.

During a routine inventory of waste stored at the AMWTP, the production planning manager found a drum that was recorded as having been shipped to WIPP the previous month. Subsequent investigations showed that the drum had been approved to be placed in a Standard Waste Box (SWB) - a type of overpack container - for the shipment, but that another drum had been mistakenly put in the SWB. The drum that was recorded as having been placed in the SWB had not been certified to WIPP program requirements prior to shipment. The container identification number of this drum is 10161094. The container identification number of the drum that should have been overpacked in the SWB was 10106194.

A fact finding meeting was held the next day. This revealed that an incorrect drum was retrieved from storage for the overpack payload. The operators who retrieved it did not ensure the drum had the proper barcode label (i.e., that the barcode scanned and entered into the Waste Tracking System (WTS) matched the WIPP waste information system (WWIS) build instruction that had been provided by the Transportation Certification Official). This error was further propagated due to the procedure steps for verification that drums being placed into an overpack (SWB or Ten Drum Overpack) match the WWIS build instructions from the Transportation Certification Official (TCO), are not as clearly delineated as the applicable procedure steps for verification of non-overpacked containers.

Manager Review By: Elvin Dumas	**Manager Review Date:** 7/18/2007 3:30:00PM
QA Closed-Cancelled By:	**QA Closed-Cancelled Date:**

Note: QA Closed-Cancelled Signature is based on concurrence between Responsible Manager and Quality Assurance

CORRECTIVE ACTION REPORT

CAR #: 28920

PARENT:

Is Valid: Yes	**Stop Work Order:** Yes
Significant : Yes	**WIPP Submittal Req'd?:** Yes
PAAA Applicable: Yes	**NTS Report Number:**
PAAA Reportable: No	**NTS Report Date:**

PAAA Regulations

10 CFR 820: Yes	**10 CFR 830 Subpart A:** Yes
10 CFR 830 Subpart B: No	**10 CFR 835 Rad Protection:** No
10 CFR 851Safety/Health: No	**PO Number:**
	Responsible Department: Waste Programs
	Operations Group: Operations
	Disposition Due Date: 7/20/2007 3:29:00PM
QA Mgr Rev Sign By: Elvin Dumas	**QA Mgr Rev Sign Date:** 7/18/2007 5:46:00PM

CORRECTIVE ACTION REPORT

CAR #: 28920

PARENT:

Con OPs Category: Operations Procedures	**Date Due:** 10/16/2007
	Responsible Manager: Raish, Scott
Root Cause Analysis: Yes	**Assigned Actionee:** Wale, Doug
Level A Cause Code:	**Contibuting Cause Level A:**
Level B Cause Code:	**Contibuting Cause Level B:**
Level C Cause Code:	**Contibuting Cause Level C:**

Corrective Action Plan: Immediate Actions:

1. Suspended all payload assembly activities involving overpacks.

2. Suspended all shipments to WIPP.

3. Identified all shipments enroute to WIPP, and received at WIPP but not yet emplaced, that contained overpack payload containers. Eight shipments were identified containing a total of 21 overpack payloads, with 128 inner containers.

4. Performed a 100% verification of the eight shipments to confirm that all inner containers for all overpack payloads certified in the WWIS are accurately identified in the AMWTP Waste Tracking System (WTS) and were traceable to each of the overpacks.

5. Evaluated the WTS container movement history and confirmed movement of all 128 containers to WMF-635 staging location for overpack.

6. All previously assembled overpack payloads remaining at AMWTP will be reverified to confirm that all inner containers for all overpack payloads are accurately identified in the AMWTP Waste Tracking System against the WWIS approved payload configuration, under the oversight of CBFO designated personnel.

7. Modify INST-OI-21, Payload Assembly and MP-TRUW-8.5, TRU Waste Certification, to incorporate DOE-CBFO directed changes.

Investigative action:

A formal investigation and root cause analysis has been initiated. Reference RCA-07-005.

Mgr Disp App By:	**Mgr Disp App Date:**
QA Add'l Disp. Req'd By:	**QA Add'l Disp. Req'd Date:**
Mgr Add'l. Disp App By:	**Mgr Add'l. Disp App Date:**
QA Mgr Rev Disp Sign By:	**QA Mgr Rev Disp Sign Date:**
CAP Complete Comments:	
Action Complete By:	**Action Complete Date:**
QA Add'l Action Req'd By:	**QA Add'l Action Req'd Date:**
Add'l Action Complete By:	**Add'l Action Complete Date:**
QA Verification Complete By:	**QA Verification Comp Date:**

Enclosure 4 – Root Cause Analysis number RCA-07-005 for CAR 28920 (6 pages)

Section 1:

Reference Document(s) (i.e. ORPs Corrective Action Report[s]):

EM-ID-BBWI-AMWTF-2007-0013 ORPS Report

AMWTP Corrective Action Report (CAR) 28920

Section 2:

Problem/Condition Description:

On 7/16/2007, personnel at the Advanced Mixed Waste Treatment Project (AMWTP) discovered that a shipment of Transuranic Waste (TRU) made on June 23, 2007 to the Waste Isolation Pilot Plant (WIPP) had contained a drum which was not approved to be shipped. This container was shipped in TRUPACT-II cask serial number 190, in shipment IN070356. This condition caused non-compliances with WIPP Program requirements. Therefore, this event was categorized as reportable under ORPS.

During a routine inventory of waste stored at the AMWTP, the production planning manager found a drum that was recorded as having been shipped to WIPP the previous month. Subsequent investigations showed that the drum had been approved to be placed in a Standard Waste Box (SWB) – a type of overpack container – for the shipment, but that another drum had been mistakenly put in the SWB. The drum that was recorded as having been placed in the SWB had not been certified to WIPP program requirements prior to shipment. The container identification number of this drum is 10161094. The container identification number of the drum that should have been overpacked in the SWB was 10106194.

A fact finding meeting was held the next day. This revealed that an incorrect drum was retrieved from storage for the overpack payload. The operators who retrieved it did not ensure the drum had the proper barcode label (i.e., that the barcode scanned and entered into the Waste Tracking System (WTS) matched the WIPP waste information system (WWIS) build instruction that had been provided by the Transportation Certification Official). This error was further propagated due to the procedure steps for verification that drums being placed into an overpack (SWB or Ten Drum Overpack) match the WWIS build instructions from the Transportation Certification Official (TCO), are not as clearly delineated as the applicable procedure steps for verification of non-overpacked containers.

Section 3:

Summary of Investigation and Analysis Conclusions: This report is a summary of information gathered for the time frame starting with payload development of SWB BN10166592 to identify the sequence of events for determination of how the incorrect container was mistakenly put in the SWB.

On June 6, 2007, TCOs provided a Payload Notification to Production Planning and Operations for SWB BN10166592. Inner containers identified on the notification for loading into the SWB were: 10147868, 10149070, 10106194 and 10147752.

On June 9 and 10, 2007, four containers were retrieved from their storage locations and the pallet was moved into Building 635 Staging Area. The containers retrieved were: 10147868, 10149070, 10161094 and 10147752.

Containers are retrieved using the Overpack Payload Container Transportation Certification Document (OPCTCD) or the Payload Build Report provided by Production Planning which is derived from the OPCTCD.

Waste Movement Personnel for Crews A/C use the Payload Build Report which provides the container identification number and location, thus eliminating the need to manually query WTS for locations.

Waste Movement personnel for Crews B/D typically use the OPCTCD to retrieve containers. The OPCTCD does not provide container location which then requires the Waste Movement personnel to manually enter the container identified on the OPCTCD into WTS and query for location.

Retrieval of the four containers for SWB BN10166592 was completed on B/D Crew Shift.

On June 10, 2007, the Operation Technician entered Building 635 and all four containers were located on the pallet with the SWB staged next to the pallet. The Operation Technician then proceeded to scan the containers in accordance with INST-OI-21, Rev. 26; Payload Assembly, Section 4.16.3 to complete overpack. Review of WTS history for these four containers identified that all four containers were scanned into WTS within forty-two (42) seconds of each other by the same Operation Technician. Based on this information, this team has concluded that the containers were scanned into WTS and manual data entry was not used to query these containers to complete overpack.

Section 3: Summary of Investigation and Analysis Conclusions cont.

Based on interviews with Operation Technician performing this step on June 10, 2007, as the containers were scanned into WTS, he verified that the container identification label on the drum matched the container information populated on the WTS screen.

It is the conclusion of this team that at this point in the process, the Operation Technician was not aware that one of the containers scanned into WTS was in error compared to the OPCTCD. INST-OI-21, Rev. 26; Payload Assembly, Section 4.16.3 does not require the Operation Technician to verify that the container scanned/entered into WTS matches the containers provided on the OPCTCD.

When Waste Movement personnel, Crews B/D, used the OPCTCD to retrieve containers instead of the Payload Build Report, this resulted in manual entry of the containers identified on the OPCTCD into WTS to query for container location.

There is no formal process/procedure for development, control and issue of the Production Planning Payload Build Report and subsequent hand-off to Operations.

Review of INST-OI-21, Rev. 26; Payload Assembly; Section 4.16, Steps 4.16.1 through 4.16.4 confirms that at no time in the process of building an SWB Payload is the container actually being loaded into the SWB verified and signed off as matching the containers provided on the OPCTCD or the Payload Build Report.

Review of INST-OI-21, Rev. 26; Payload Assembly also identifies this process gap in regards to TDOP Payload Assembly.

Section 4:

Extent of Condition Evaluation:

On July 17, 2007, AMWTP validated that there were no discrepancies in waste drums that were containerized in overpacks that were identified in transit to WIPP or identified in the WWIS as received at WIPP but not yet emplaced. From these shipments a shipment list was created for the overpack payloads and internal containers associated with each overpack payload from WWIS. AMWTP put together a spreadsheet of these containers and validated it against the WWIS and WTS overpack screen shots to confirm accuracy. Specifically AMWTP compared this WWIS derived list to the WTS overpack inner containers listed for each of the overpacks in WTS. The WTS list was derived from the barcode scans at the time of the overpack payload assembly. There were no discrepancies between WWIS and WTS containers.

AMWTP next evaluated the final move locations for each of the containers in the overpacks. In each case, AMWTP confirmed the last location to be WMF-635, the facility where the overpacks are assembled. There were no discrepancies identified.

Lastly, AMWTP will complete physical inventory container verification for each of the facilities. Physical inventory will be validated against the WTS recorded inventory.

Section 5:

Precursor/Historical Review Evaluation:

Under CAR 28920 an action has been identified to perform 100% physical verification of remaining inventory.

Section 6:

Assessment Performance Evaluation:

A review of assessments performed in the last twelve months for Shipping and Payload Assembly Operations did not identify any issues resulting from the performance of Payload Assembly of TDOPs, SWBs, Single Container Payloads, 55-Gallon Drum Payloads, 100-Gallon Drum Payloads or "Tall" 85-Gallon Drum Payloads.

It is noted that in reviewing these assessments, at no time were assessments performed specifically on the payload assembly process as provided in INST-OI-21, Rev. 26; Payload Assembly.

An evaluation or assessment may have identified this weakness.

Section 1:

Analysis Methodology: Conducted barrier analysis of management controls to determine where the failure occurred.

- Review of INST-OI-21, Rev. 26; Payload Assembly work processes and conducted personnel interviews.

Section 2:

Root Cause(s) of the Problem:

INST-OI-21, Rev. 26; Payload Assembly does not provide sufficient instructions for Non-Facility Operations personnel to confirm containers being loaded into SWBs are the same containers as those identified on the OPCTCD provided by the TCO. Furthermore, the procedure does not explicitly require dual verification of overpacked containers by the TCO.

A5/B2/C08 – Communication LTA, Written Communication LTA, Incomplete/Situation Not Covered

Section 3:

Contributing Cause(s) of the Problem:

Previous assessments have not been performed specifically on the payload assembly process as provided in INST-OI-21, Rev. 26; Payload Assembly.

A4/B1/C04 – Management Problem, Management Methods LTA, Management Follow Up/Monitoring of Activities did not Identify Problems

Manual entry of containers identified on the OPCTCD into WTS to query for container location results in wrong container retrieved from storage.

A3/B1/C01 – Human Performance LTA, Skill Based Error, Check of Work LTA

There is no formal process/procedure for development, control and issue of the Production Planning Payload Build Report and subsequent hand-off to Operations.

A5/B3/C01 – Communication LTA, Written Communication Not Used, Lack of Written Communication

Section 4:

Recommended Corrective Action(s):

A systematic analysis of all procedures associated with Shipping and Certification needs to be performed to identify critical hold points that require independent verification.

A process/procedure needs to be developed and implemented which controls the Production Planning Payload Build Report and subsequent hand-off to Operations.

Section 5:

Investigation Team Members:

Corrina Stailing, Waste Programs

Charles Posegate, Operations

Travis Thompson, Operations

ROOT CAUSE ANALYSIS REVIEW AND APPROVALS:

	Print Name	Signature	Date
Investigation Team Lead Review by:	Angie Morse	Angie Morse	07-19-07
Responsible Manager:	Scott Raish	Scott C Raish	07-19-07
QA Manager:	Elvin Dumas	Elvin Dumas	07-19-07