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Contaminated Trailers Shipped to NNSS

Lessons Learned

April 23-27, 2012

Chronology Summary of Events

- **September 22, 2011, two LLW shipments were transported to the Nevada National Security Site (NNSS) for disposal.**
- **September 27, 2012 LANL notified about radiological contamination on one trailer.**
- **September 28, 2012 Original CAR issued.**
- **September 29, 2012**
  - LANL notified about radiological contamination on second trailer.
  - LANL self suspended shipments
- **A total of thirteen (13) trailers at NNSS and (3) trailers at LANL were contaminated.**
- **October 4, 2011 NSO issued corrective action request (CAR) RWAP-C-11-09 with suspension of shipments.**

Scope of Root Cause Analysis/Investigation

- **General Package Pre-Use Information**
  - Procurement & receipt inspections
  - Storage/staging prior to loading
  - Pre-use package integrity evaluation
  - Potential changes to manufacturing process, materials, and suppliers
  - Compatibility with waste material
    - physical/chemical,
    - Moisture
    - isotopic solubility
- **Package Use/Storage**
  - On site storage program for loaded waste containers
  - Physical integrity of loaded containers
  - Containers rated weight capacity vs. actual load
  - Number of times containers were handled loaded

Scope of Root Cause Analysis/Investigation

- Radiological Surveys
  - Adequacy of vehicle & container survey
  - Statistical evaluations of the existing LANL radiological survey methodology
  - History of on site shipments (TA-21 to TA-54)
  - on site surveys of CAST and LANL trailers
  - Detection of contamination using LANL method on trailers returned from NNSS
  - Adequacy of surveys on shipments to other facilities
  - surveys of waste loading areas
  - waste storage areas surveys
  - package handling equipment

Root Cause Analysis

- **Root Cause :**
  - Containers were not stored in accordance with the NNSS WAC Section 3.2.10
  - Specifically, during rain the plastic in storage areas inhibited water runoff and caused water to pool around the bottom of containers. Localized areas of standing water potentially degraded the containers creating conditions that allowed radioactive contamination to migrate through the external surfaces of the containers during extended transport.
  - This migration of contamination through the external surface of the containers directly lead to the contamination of transport vehicles
  - Storage method was based on vendor information that the containers could withstand exposure to the elements.
  - These waste containers required additional protection from the elements.

ROOT CAUSE (cont.)

- **Contributing Factor :**
  - Radiological survey methodology was less than adequate as the centerline of the transport could not be surveyed.
  - Radiological survey approach at 2 locations at LANL were not consistent.

Corrective Actions Summary

- **September 2011 - LANS initiated moving the WCO and the NNSS approved program into the LANS ADESH&Q Environmental Division organization in response to NNSS RWAP observation.**
- **Waste packages generated for disposition at NNSS will be stored in compliance NNSS WAC Section 3.2.10 and the LANL WAC Section 17.2.9 to protect containers from degradation from the environment (e.g., weather, UV)**
- **Containers will have a detailed radiological surveys performed prior to loading.**
- **Transport vehicles destined for NNSS will have detailed direct radiological surveys performed on 100% of load surfaces.**
- **LANL will issue a lessons learned regarding the events. Objective evidence: Documentation demonstrating that DOE Lessons Learned has been created.**

Corrective Actions

- **LANL Health Physics Operations Group Management will revise current survey procedures to address deficiencies noted in this CAP investigation.**
- **LANL WCO will coordinate formal documented training/briefing(s) on the revised NNSS radiological survey shipment requirements.**
- **LANL WCO Program procedures will undergo a complete review by the new organization to improve the overall program compliance with NNSS WAC.**

Lessons Learned

- **Radioactive waste packages must be stored in accordance with the NNSS WAC Section 3.2.10 that states packages shall be stored in a secure area to prevent deterioration and that storage should include protection from adverse weather, particularly rain and/or snow.**
- **All transport vehicles destined for NNSS will have detailed direct radiological surveys performed on 100% of load surfaces (including centerline) prior to entry into a LANL controlled area and loading and prior to release to NNSS to verify no radiological contamination greater than allowable limits as specified in the NNSS WAC Section 3.2.13 is on the surface of the trailer.**
- **LANL WCO organization will be realigned to provide independence from the project execution organization.**

Lessons Learned

- **The Health Physics Operations Group Management will revise current LANL survey procedures to address deficiencies noted in this CAP investigation regarding protocols for incoming and outgoing NNSS shipments. Revisions will address standardization of survey procedures, revision of the current VSP to ensure a confidence level of radiological surveys for shipment incoming, outgoing, and pre-loading surveys to meet 10 CFR 835, Appendix D and NNSS WAC Section 3.2.13 requirements, and survey techniques that ensure that areas of the trailer (such as the trailer centerline) that cannot be reached from the ground are encompassed in the radiological survey.**

QUESTIONS?

Background Slides

NNSS Contaminated Trailers

NNSS Contaminated Trailers

NNSS Contaminated Trailers

Radiological Personnel Surveying Shipment at Clive Facility

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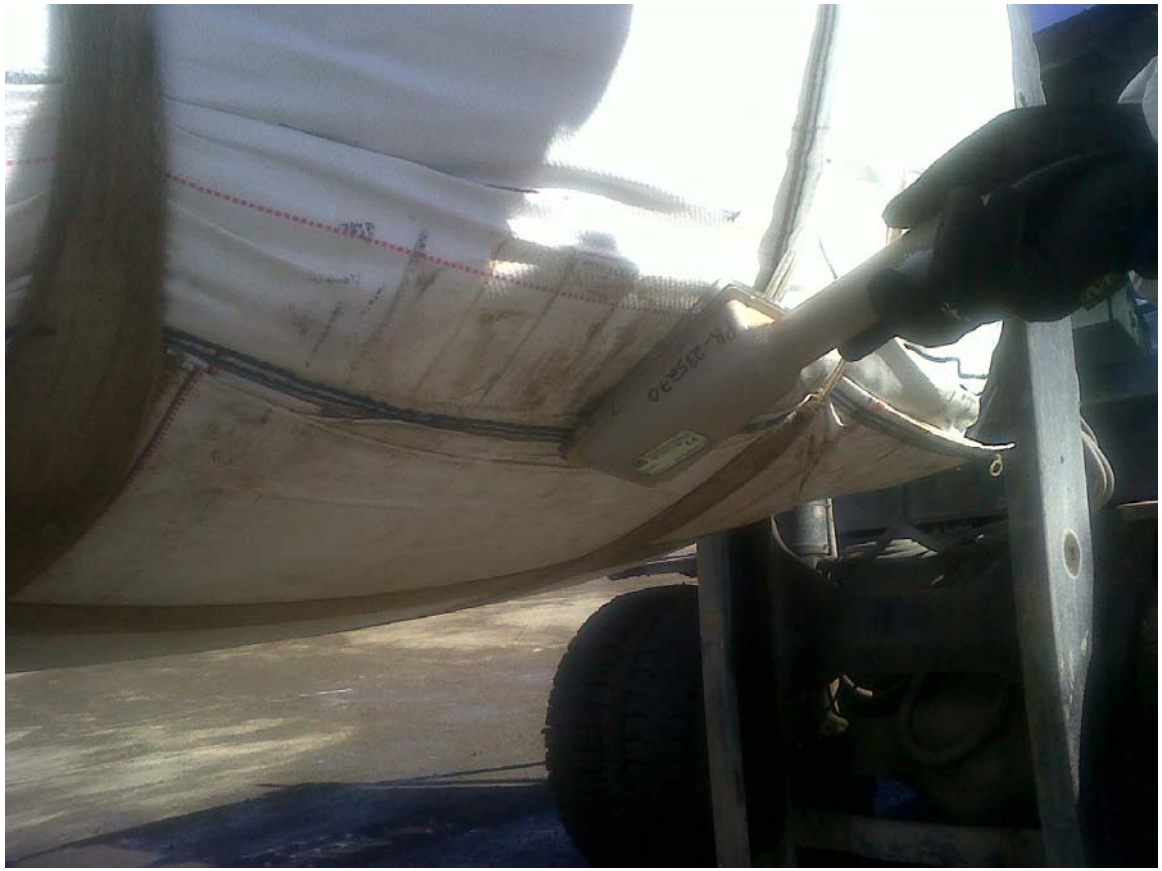
Soft-sided container where contamination was detected



Soft-sided container where contamination was detected

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