

Date sent: Wed, 19 Aug 1998 15:17:29 -0500  
From: Meredith Brown [racer@lanl.gov](mailto:racer@lanl.gov)  
Subject: Blue Alert: Shipping Cask Rad Streaming

Project Hanford Lessons Learned

Title: **Unexpected High Dose Rate Detected while Loading FRG Cask**

Date: August 11, 1998  
Identifier: 1998-RL-HNF-0025

**Lessons Learned Statement:**

Even previously approved certified packaging devices may pose a hazard to workers while transporting waste. Surveys should be performed to detect streaming and appropriate mitigation taken to prevent unnecessary exposure. The introduction of large air gaps in a partially loaded shipping cask can lead to unexpected results.

**Discussion of Activities:**

**Summary:**

During the loading of GNS-12 shipping casks, higher than expected dose rates were detected. The dose rates were 400 mr/hr at contact and 80 mr/hr at 30 cm. They did not create a significant hazard to facility personnel or adversely affect facility operations.

**Details:**

On August 23, 1997, two GNS-12 shipping casks were loaded with two isotope heat/radiation sources for transport from the 324 Building to the Central Waste Complex. A Radiological Control Technician (RCT) performed a routine survey on the first cask and found the dose rate was higher than expected. The second cask was then surveyed and found to have a similar dose rate.

**Analysis:**

A gap in the lead shielding near the top of the walls was discovered on the cask drawings. Also, only 2 of the three cylindrical openings in the cask were filled, and the increased dose rate was observed at the point farthest from the sources. These two factors caused the higher than expected dose rate.

An investigation determined that the casks were designed and built in Germany. The casks were inspected and accepted by representatives from the Hanford Quality Assurance and B&W Hanford Company Operations in December 1996 in Germany. Although U. S. certification expired in 1997, the casks were again inspected in February 1997. The Hanford Site completed a Safety Analysis Report for Packaging (SARP) based on the German Safety Analysis Report. The

SARP was approved by DOE-RL in March 1997, without additional shielding performance analysis of the casks.

**Recommended Actions:**

This event was a unique experience and will not be repeated at the 324 facility since the project requiring the casks is complete. Two corrective action options have been suggested to lower the dose rate should a similar event occur at other facilities:

- Leave the impact limiter on the casks
- Fabricate a new cap for the casks to provide additional shielding during transport.
- Insure that no air gaps are left in shipping casks.

Priority Descriptor: BLUE/Information

Functional Categories (DOE): Radiological Protection, Packaging & Transportation, Quality

Functional Categories (User-defined): N/A

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Keywords: GNS-12 shipping cask, shielding, dose rate, impact limiter

References: Critique Report Number 324-97-16