PHMC Lessons Learned/Operating Experience

Information Bulletin

Fluor Hanford

Packaging Container Exceeds SARP Limit

April 16, 2008 **2008-RL-HNF-0007** **Tracking No: 927**

Summary: A Design Authority discovered a container had been shipped off site containing one item exceeding the Safety Analysis Report for Packaging (SARP) limit for Plutonium 242 (^{242}Pu). The use of formal SARP Implementation Plans and more detailed, comprehensive independent peer reviews would have prevented this non-conformance.

Discussion of Activities: The 9975 SARP requirement/limit for Plutonium 242 (^{242}Pu) has a maximum weight percent limit with respect to the radioactive material mass. On 01/16/2008, the Backup Packaging & Shipping Design Authority (DA) discovered that in Fall 2007, the facility shipped one item packaged in a 9975 Shipping Container that contained greater than the maximum allowable wt% ^{242}Pu. Upon further evaluation, fourteen additional items which exceeded the ^{242}Pu requirement/limit were identified which had not been shipped.

Analysis: The facility was approved to use the 9975 containers for shipping. In December 2003, the SARP for Model 9975 Shipping Containers was issued. Shortly after the approval, some revisions were made to the weight percent limits in the SARP table for various isotopes, but did not address or identify the wt% limit for ^{242}Pu as a specific issue. In 2005, a SARP revision was issued in response to a DOE request to modify it based upon identified issues dealing with various issues and limits. In both cases, for these revisions, the facility did not develop formal implementation plans (IPs). Use of formal IPs, along with detailed compliance matrices, would have flagged the wt% parameter value for ^{242}Pu in the container working database. If this parameter within the database had been updated with the SARP's wt% ^{242}Pu limit value, then the fifteen items exceeding the limits would have been identified before the 9975 packaging and shipping in 2007.

Facility technical staff assumed the requirement issues identified in late-2003 and mid-2004 regarding the SARP addressed all concerns for shipping. The facility relied upon multiple review activities by internal and external organizations. Based on these reviews and the feedback/approvals received, facility management and Technical Support Staff believed they were fully compliant in meeting the 9975 SARP. This overconfidence was supported by the numerous reviews, checks, and oversights performed by in-house and outside expert organizations.

While Hanford's Transportation Project Support (TPS) developed calculations, made shipping labels and prepared shipping paperwork for the shipment, they did not independently check the isotopic wt% requirements/limits of the 9975 Shipping Container Certificate of Compliance, which contains the same radioactive material mass limits as the 9975 SARP. Manual or automated data review tools to verify the container working database against the 9975 SARP could have identified the non-compliant ^{242}Pu items.

Independent reviews of the facility shipping plan and other shipping data packages did not discover the ^{242}Pu limit issue. The reviews performed did not focus on the data tables, specifically ^{242}Pu values, as reviewers assumed the data to be compliant. The author and four additional signers of the shipping plan, the shippers and receivers of the 9975 shipment documents as well as numerous technical reviewers all approved the shipment of the non-compliant 9975. None of the shipment reviewers identified the non-compliant 9975. Independent and peer reviews need to be detailed, structured and comprehensive.

Recommended Actions:

- When modifications are made to a SARP, use formal implementation plans and associated verification processes, similar to those used for facility-specific documented safety analysis changes.
- A compliance-based data review tool should be developed to assist technical staff personnel in overcoming any mind set and invalid assumptions, which may affect the outcome of their analysis and review activities.
- Independent peer reviews need to be detailed, structured and comprehensive.

Work Function: Authorization Basis, Packaging and Transportation

ISM Core Functions: Develop/Implement Controls

Originator: Fluor Hanford, Inc., Submitted by R.G. Wilbanks and J. W. Smith

Contact: PHMC Lessons Learned; *(509) 372-2166; e-mail: PHMC_Lessons_Learned@rl.gov*

References: PFP-HPI-2008-002, *HPI Review of 9975 SARP Non-Conformance*

PFP-LL-08-003, *9975 SARP Non-Conformance*