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7 PACKAGE OPERATIONS

The Versa-Pac Shipping Package is used to transport a variety of materials. It is to be loaded, inspected and handled in accordance with standard, plant operating procedures.

Due to the low specific activity and low abundance of gamma emitting radionuclides, dose rates from the contents of the package are minimal. As a result of the low dose rates, there are no special handling requirements for radiation protection.

At a minimum, the operating procedure should include the steps described in the subsequent sections.

7.1 *Package Loading*

7.1.1 Preparation for Loading

Prior to loading the Versa-Pac, the packaging is inspected to ensure that it is in unimpaired physical condition. The inspection looks for damage, dents, corrosion, and missing hardware. Acceptance criteria and detailed loading procedures derived from this application are specified in user written procedures. These user procedures are specific to the authorized content of the package inspected to ensure packaging complies with Appendix 1.4.1, Packaging General Arrangement Drawings.

Components requiring repair will be fixed prior to shipping in accordance with approved procedures consistent with the quality program [1].

The User shall inspect the accessible surfaces of the closure and sealing devices in accordance with approved procedures prior to loading of the container to assure the following at a minimum:

- a. Ensure that the most recent certification performed is in accordance with Section 8.2.
- b. The contents are within the limits of the Certificate of Compliance.
- c. The package inner and outer surfaces are visually free from damage that may impair the safe use of the package.
- d. The Package is free of debris or other foreign matter that could interfere with the proper and safe use of the container.
- e. Verify that the outer drum and visible inner plugs are in place.
- f. Gaskets are in place and intact and are not deteriorated or damaged. Replace as needed.
- g. The containment flange and outer drum cover and all mating surfaces are sound and fit properly.
- h. Closure bolts are the proper type and size and that thread inserts are in working order.
- i. Ensure that security seal holes are functional and capable of maintaining their integrity when seals are required.

- j. When utilizing the 5-inch pipe configuration, visually inspect the threads for damage that would interfere with the appropriate operation of the cap and body connection obtaining the minimum 5 full turns of closure. If required, repair threads by an appropriate method or replace the component.

7.1.2 Loading of Contents

All radioactive contents are loaded into the inner container. The maximum loading shall comply with the limits given in Section 1.2.2, Contents.

The User shall load the packaging in accordance with in-plant approved procedures and at a minimum include the following items:

- a. Verify that the steps previously outlined by Section 7.1.1 have been completed at a minimum.
- b. If loading 1S/2S UF₆ cylinder contents, verify the inner container cavity foam liner is in place at the bottom and side walls before loading the contents. The foam liner must be at least 2 inches (5.08 cm) thick at all sides, bottom and top. All 1S/2S cylinders should be cleaned of any contamination prior to loading.
- c. The contents may be pre-packaged within plastic jars, sealed metal cans, plastic bags, drums or other appropriate forms; however, these items are not required for transport.
- d. If using the 5-inch pipe, screw the cap onto the containment vessel body until at least five but not more than eight threads are engaged.
- e. Verify that the neoprene bottom pad is in place. The bottom neoprene pad is optional for vessels that are not intended for reuse.
- f. Verify that no freestanding liquids or other volatile compounds are present in the containment area prior to loading of contents.
- g. Carefully load the package content into the inner container. If loading multiple 1S/2S UF₆ cylinders or multiple 5-inch pipe contents, ensure each container is not in contact with one another. Cribbing or dunnage may be used to restrict movement of the contents during transport.
- h. Position the neoprene sponge rubber top pad atop the contents. (The top neoprene sponge rubber pad is optional for vessels that are not intended for reuse.)
- i. If loading 1S/2S UF₆ cylinder contents, verify the inner container cavity foam top liner is in place before securing the inner container flange lid. The top liner must be at least 2 inches (5.08 cm) thick.
- j. Place the inner container flange lid and gasket into place and tighten the bolts lock washers to the specified torque of 60±2 lb-ft.
- k. Place the outer gasket in place and carefully install the outer reinforced insulated drum cover.
- l. Install the appropriate bolts and washers and tighten to the specified torque of 60±2 lb-ft.

- m. Secure the outer drum closure ring and tighten to 60 ± 2 lb-ft and tighten the jam nut against the bolt lug.

7.1.3 Preparation for Transportation

- a. Install the security seals and record their numbers, if applicable.
- b. Complete a radiation and contamination survey in compliance with the applicable regulations.
- c. Remove any old labels and re-label per the applicable regulations.
- d. Records should be maintained in accordance with the appropriate regulations.

7.2 Package Unloading

The User shall unload the Versa-Pac in accordance with in-plant approved procedures and at a minimum include the following items:

7.2.1 Receipt of Package from Carrier

- a. Complete a receiving report and complete any survey's that are appropriate.
- b. Remove and record the package seal, if applicable.

7.2.2 Removal of Contents

- a. Loosen and remove the outer drum lid closure ring, reinforcing ring bolts and insulated drum cover.
- b. Loosen and remove the bolts from the inner container flange.
- c. Remove the contents from the inner container.

7.3 Preparation of Empty Package for Transport

Empty Versa-Pac packages are prepared and transported per the requirements of 49CFR173.428 [2]. Prior to shipping as an empty Versa-Pac packaging, the packaging is surveyed to ensure that contamination levels are less than the 49CFR173.433(a) limit. The packaging is inspected to ensure that it is in an unimpaired condition and is securely closed so that there will be no leakage of material under conditions normally incident to transportation.

Any labels previously applied in conformance with 49CFR172 subpart E [3] are removed, obliterated, or covered and the "Empty" label prescribed in 49CFR172.450 [3] is affixed to the packaging.

7.4 Other Operations

Not applicable.

7.5 References

- [1] Daher-TLI, "QUALITY ASSURANCE PROGRAM DESCRIPTION," Rev. 1, 2016.
- [2] United States Department of Transportation (USDOT), "Title 49, Code of Federal Regulations, Part 173: Shippers—General Requirements for Shipments and Packagings, Subpart I - Class 7 (Radioactive) Materials".
- [3] United States Department of Transportation (USDOT), "Title 49, Code of Federal Regulations, Part 173: Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Reponse Information, Training Requirements, and Security Plans, Subpart E - Labeling".

7.6 List of Appendices

Not applicable.