UNLOADING PROCEDURE FOR
FRONTIER TECHNOLOGY CORPORATION
MODEL 50240 SHIPPING PACKAGE
WITH
WEP PLUG SOURCE HOLDER

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DISCLAIMER

These procedures are provided to supply information concerning the mechanical construction of the shipping package and the mechanical steps associated with unloading and loading the package. They are not designed or intended, and cannot be used, to replace proper radiological health procedures to be followed when handling radioactive materials. The package should be unloaded or loaded only in the presence of a Radiation Safety Officer and only by persons trained and authorized to handle radioactive materials.

I. GENERAL DESCRIPTION

The Frontier Technology Corporation Model 50240 shipping package is a Type A package meeting DOT Specification 7A. The package is designed to transport Special Form Californium-252 neutron sources up to approximately 12 micrograms, but it may also be used to transport Type A quantities of other radioactive materials in Special Form provided that pertinent regulations are complied with.

The Model 50240 container is constructed per Frontier Technology Corporation (FTC) drawing number A50240-AA00. Basically, it is a 5-gallon USDOT Specification steel drum filled with water-extended-polyester (WEP) shielding material. The radioactive source is located in a cavity in a WEP plug which in turn is located within an 2” schedule 40 steel pipe. Weight of the container is approximately 45 pounds.

II. ACTIONS TO BE TAKEN UPON RECEIPT OF LOADED PACKAGE

CAUTION: These steps should be performed under supervision of your Radiation Safety Officer or by persons trained and authorized to handle radioactive materials.

A. Monitor Radiation:

Survey total Gamma and Neutron radiation fields. Verify Transport Index stated on package.

B. Monitor Radioactive Contamination:

Perform smear test of package surfaces for removable radioactive contamination.

C. Check Security Seal:

A security seal should be present. The seal is in the form of a wire through the body of the bolt holding the bolt ring onto the package, with the ends of the seal wire embedded into a lead seal having raised letters “FTC”. Verify the presence of the seal and that the lead seal disk has the Frontier Technology Corporation logo “FTC”.

D. Immediately notify Frontier Technology Corporation of any improper conditions.

III. ACTIONS TO BE TAKEN PRIOR TO OPENING THE PACKAGE

A. Examine Drawings and Unloading Procedure:

Examine drawing of the shipping package and Figure 1 of this procedure. Read this procedure completely through. If any steps are unclear or if you have any questions, call Frontier Technology Corporation, telephone number (937) 376-5691.

B. Place the Container:

Move the container to the location where it is to be unloaded. This location should be in a restricted area covered by your radioactive materials license.

C. Obtain Tools Necessary to Unload the Package:

Tools required:

Wire cutters
1/2-inch wrench
Screwdriver (flat blade)
Adjustable Pliers

D. Remove the bolt ring and drum cover.

E. Just inside the drum is a black 2-inch steel pipe cap. Remove the cap by turning it counter clockwise.

F. The top of a WEP shield plug is now visible inside the 2-inch steel center pipe and is exposed approximately 1/4 inch above the 2" steel center pipe for grasping and removal. On top of the shield plug contains an identification tag for each of the sources in the container. A string is attached to each tag, and extends downward into the pipe alongside the shield plug, and are attached either to an open-top "bucket" inside of which the source is located, or to an eyelet adapter threaded onto a stud on the source. Remove the tags from the cavity and place them outside the pipe so that the strings are out of the way of the shield plug. Lift the plug by grasping the exposed end of the top plug and pulling upward until the plug is entirely out of the pipe.

G. The source "buckets" or source eyelet adapters are now visible in cavities inside the pipe. Remove the "buckets" (with source) or the source-adapter assemblies one at a time from the container by pulling the attached strings vertically upward. A source may be removed from a "bucket" by turning the "bucket" upside down.

CAUTION: THIS WILL EXPOSE THE UNSHIELDED SOURCE. THE NEUTRON AND GAMMA RADIATION LEVELS IN AIR AT ONE METER FROM AN UNSHIELDED _____ MICROGRAM CF-252 SOURCE ARE APPROXIMATELY _____ mREM/HR AND _____ mREM/HR, RESPECTIVELY. CAREFULLY MONITOR NEUTRON AND GAMMA RADIATION LEVELS. USE DISTANCE AND/OR SHIELDING TO REDUCE EXPOSURE TO PERSONNEL

H. Remove all sources following the applicable procedure. Unloading is now complete. Prepare the package for return to Frontier as outlined below.

I. Perform a wipe test for removable contamination on the internal surfaces of the package and the surfaces of the internal components. The removable contamination averaged over each 300 sq cm of surface must not exceed 10^{-4} uCi/sq cm (220 dpm/sq cm) alpha and 10^{-3} uCi/sq cm (2200 dpm/sq cm) beta-gamma [49 CFR 173.427 (c) and 173.443 (a)].

J. Replace the steel pipe cap, securing it to the package by turning it clockwise. Tighten only hand tight.

K. Inspect the gasket on the inside of the drum cover. If not in good condition, replace it.

L. Replace the drum cover onto the drum.

M. Replace the bolt ring and tighten the bolt and lock nut securely.

N. Place a seal wire through the hole in the bolt and seal.

O. Remove or cover the Radioactive labels (i.e., yellow diamonds) from the container and place two DOT "Empty" labels on the container, one on each side. [Required by 49 CFR 173.427. Label specification is 49 CFR 172.450].

P. Survey the package for neutron and gamma radiation. Total level at any point on the external surface of the package must not exceed 0.5 mRem/hr. [49 CFR 173.427(a) and 49 CFR 173.421(b)].

Q. Survey the external surfaces of the package for removable contamination using the swipe test method. Maximum permissible levels over any 300 square centimeter swipe area are 10^{-6} uCi/sq cm (2.2 dpm/sq cm) alpha and 10^{-5} uCi/sq cm (22 dpm/sq cm) beta-gamma. [49 CFR 173.427(a), 173.421(c), and 173.443(a)].

R. Remove the statements "Special Form", "Non-Fissile" and "UN3332" from each side of the package and replace with: "Excepted Package, Empty Packaging" and "UN2908", also on each side of the package. Marking must be in a color which contrasts with the color of the package where the marking is put, the letters must be at least 1/2 inch high, and the marking material must be durable.

EXAMPLE:

RADIOACTIVE MATERIAL		RADIOACTIVE MATERIAL
TYPE A PACKAGE		EXCEPTED PACKAGE
SPECIAL FORM, NON-FISSILE	**REPLACE WITH**	EMPTY PACKAGING
CLASS 7 UN3332		CLASS 7 UN2908

S. Mark package with the name and address of consignee and the name and address of consignor, making clear which is which.

T. Examine package for damage and completeness. The package must be in unimpaired condition and securely closed so that there will be no leakage of radioactive material under conditions normally incident to transportation.

U. The package is now ready to ship. It must be shipped as a hazardous material with appropriate shipping paper and shipper's declaration.