The source assembly is initially loaded into the SPEC C-1 source changer at the SPEC facilities under the provisions of Louisiana Radioactive Material License LA-2966-L0l in accordance with the procedures and radiation protection standards established under that license and 10 CFR 71.87(f). Only licensed users of the SPEC C-1 source changer may be authorized to exchange source assemblies in accordance with specific provisions of their agreement state or NRC radioactive material license.

Procedures for Preparing and Loading the Package

The SPEC C-1 shall be loaded and prepared for shipment in accordance with written operating procedures. The user will ensure that the use of the package complies with the conditions of approval in the Certificate of Compliance, including authorized contents.

1. Package Registration

   Before first use of the package, in accordance with 10 CFR 71.12(c)(3), the shipper, including users who transport the SPEC C-1 steel drum overpack configuration as a private carrier, must register as a user of the package by writing to:

Director, Spent Fuel Project Office U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001

2. General Packaging Inspection

   A. C-1 Source Changer

      Visually, ascertain that there are no cracks, pinholes, uncontrolled voids or other defects that could significantly reduce the effectiveness of the C-1 source changer. Visually inspect the SPEC C-1 source changer to determine if it is in unimpaired condition for shipment. The SPEC C-1 source changer should be inspected to determine that it is not damaged, and that the hinges, outlet nipples and lock plungers and doors are functional.

      Verify that the C-1 source changer packaging is conspicuously and durably marked with its model number and serial number.

   B. Steel Overpack Drum

      Visually, ascertain that there are no cracks, pinholes, uncontrolled voids or other defects that could significantly reduce the effectiveness of the steel drum overpack. Inspect the steel drum, foam, and the bolt or snap ring top closures to determine if it is in unimpaired condition for shipment. Superficial dents and scratches on the steel drum overpack are permissible.

3. Loading of Contents

Verify that the lock plungers are fully depressed, that the source assemblies are properly secured, and that the doors to the SPEC C-1 source changer are fully closed and secured together by a padlock or similar fastener. Remove the key from the lock.

The SPEC C-1 source changer must fit securely in the foam cavity. When additional ancillary equipment (up to eight pounds maximum) is shipped inside the steel drum overpack with the C-1 source changer, it should be positioned between the top of the C-1 source changer and the drum lid as to limit movement of the C-1 in the event that the drum is inadvertently turned upside down during normal conditions of transport. When no additional ancillary equipment is shipped inside the steel drum overpack with the C-1 source changer, the C-1 should be braced in place to limit its movement in the event that the drum is inadvertently turned upside down during shipment. A generic spacer with sufficient strength and length placed between the C-1 source changer and the drum lid is adequate to meet this requirement. Ensure that the drum top fits snugly and is secured with a bolt or snap closure ring. Ensure that a lead wire or other shipping tamper seal is affixed to the closure ring in accordance with 10 CFR 71.43(b).

4. External Radiation Levels

Measure the maximum surface radiation level and the maximum radiation level at one meter from the surface of the package. As required by 10 CFR 71.47, the maximum surface radiation level must not exceed 200 mrem/hr and the maximum radiation level at one meter from the surface on the package (Transport Index) must not exceed 10 mrem/hr.

5. Outer Package Surface Contamination

In accordance with 10 CFR 71.87, non-fixed (removable) contamination on the external surfaces of the outer package being shipped on a non-exclusive use basis must not exceed 10^{-5} μCi/cm^2 (220 dpm/cm^2) averaged over 300 cm^2 of any part of the surface. The outer surface contamination may be determined by measuring the activity on wipes taken from representative locations and the above criteria is assumed to be met if the activity on any sample averaged over the surface area wiped does not exceed 10^{-4} μCi/cm^2 (22 dpm/cm^2). If the contamination on the surface of the outer package exceeds the above amount or if the source is known to be leaking or contaminated DO NOT SHIP, but contact Source Production & Equipment Company, Inc. for assistance.

6. Transportation Requirements

The C-1 Source Changer and Steel Overpack Drum must be properly marked,

labeled and described on a shipping paper in accordance with U.S. Department of Transportation regulations. Shipping papers will be retained for three years.

Procedures for Receipt and Unloading the Package

1. Receipt of Package From Carrier

The SPEC C-1 steel drum overpack configuration may be handled during transport and unloaded as an ordinary package by hand. No special equipment or procedures are required.

If the measured maximum radiation levels at the surface of the outside package and at one meter from the surface of the outside package exceed either of the following limits:

Location	Maximum mrem/hr
Surface of Outside Package	200
One Meter from Surface of Outside Package	10

then the consignee must immediately notify the final delivering carrier, and either the agreement state radiation control agency, if applicable, or the NRC Operations Center (301-816-5100). It is also recommended that the shipper be notified.

2. Removal of Contents

The consignee must establish written procedures for receiving and safely opening the SPEC C-1 steel drum overpack. The procedures should provide for inspection, monitoring, notification and records.

Procedures for Shipping an Empty SPEC C-1

1. Preparation of an Empty Package for Transport

Verify that the C-1 does not contain a radioactive source. Visually inspect the exchanger to verify that no source assembly connector is protruding from either outlet nipple. This will indicate that there is no source assembly installed.

Verify that the lock plungers are fully depressed and that the doors to the SPEC C-1 source changer are fully closed and secured together by a padlock or similar fastener. Place the SPEC C-1 source changer in a strong tight outside container, such as the 12 gallon steel drum overpack in which it was received.

2. External Radiation Levels

Verify that the maximum radiation level on the surface of the outside package does not exceed 0.5 mrem/hr.

3. Check Outer Package Surface Contamination

In accordance with 10 CFR 71.87, non-fixed (removable) contamination on the external surfaces of the outer package being shipped on a non-exclusive use basis must not exceed 10^{-5} μCi/cm^2 (220 dpm/cm^2) averaged over 300 cm^2 of any part of the surface. The outer surface contamination may be determined by measuring the activity on wipes taken from representative locations and the above criteria is assumed to be met if the activity on any sample averaged over the surface area wiped does not exceed 10^{-5} μCi/cm^2 (22 dpm/cm^2). If the contamination on the surface of the outer package exceeds the above amount or if the source is known to be leaking or contaminated DO NOT SHIP, but contact Source Production & Equipment Company, Inc. for assistance.

Records and Documentation

In accordance with 10 CFR 71.12(c)(1) and (c)(2), the shipper, including users who transport the SPEC C-1 steel drum overpack configuration as a private carrier, are required to have a current copy of the NRC Certificate of Compliance No. 9036, drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken before shipment. Users of the C-1 steel drum overpack configuration are required to comply with all provisions in the approval certificate.

In accordance with 10 CFR 71.91, the following records must be maintained for at least three years after each shipment:

1) Identification of packaging by the model and serial number: Model SPEC C- l, Serial Number ___ ___ ___ ___
2) Verification that the package was in satisfactory condition when shipped
3) Activity oflridium-192 in each shipment
4) Date of each shipment, note that this includes transport by a user of the SPEC C-1 steel drum overpack configuration as a private carrier
5) Name and address of the transferee
6) Address to which shipment was made
7) Records that the package was properly prepared for shipment and an indication that the package had not been in the presence of any radioactive material contamination or the results of surface contamination measurements. A shipping checklist is suitable to meet these requirements.

As required by 10 CFR 71.95, licensed users of the C-1 package shall report to the

Director, Spent Fuel Project Office within 30 days, 1) any instance in which there is significant reduction in the effectiveness of the packaging during use, 2) any instance in which the conditions of approval in the Certificate of Compliance USA/9036/B(U)-96 were not observed in making a shipment, 3) details of any defects with safety significance with the means employed to repair the defects and prevent their reoccurrence.