

**Traveller Safety Analysis Report**

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## 7 PACKAGE OPERATIONS

The following information contains the significant events relating to the routine use of fuel assembly shipping packages. Complete detailed instructions are outlined within the individual plant operating procedures and quality control instructions pertinent to each specific operation.

### 7.1 PACKAGE LOADING

#### 7.1.1 Preparation for Loading

##### 7.1.1.1 Receive Shipping Package

- Unload the shipping package from the truck.
- Report any obvious damage to supervisor.
- Prepare a package identification route card.

##### 7.1.1.2 Clean Shipping Package

- Use soap or a suitable detergent and water to clean the package.
- Hose down the package and direct a high pressure water stream.
- Move the package into *the refurbishing area to check* for water leaks.

##### 7.1.1.3 Refurbish Shipping Package

- Repair any water leaks found and remove excess water from package.
- Check package shell closure fasteners and repair damaged or rusted fasteners.
- Apply protective coating as needed.
- Inspect clamshell padding material and repair, if necessary.

##### 7.1.1.4 Configure Package for Fuel Assembly Loading

- Configure clamping pads according to fuel assembly grid arrangement.
- Place and secure spacer blocks in package as needed.
- Configure top closure jack screws.
- Repair or replace as necessary the package gasket.
- Verify that accelerometers are sealed, calibrated, and not tripped. Replace if required.

##### 7.1.1.5 Inspection

- Verify that the Outerpack and clamshell interior and exterior are clean, and in good condition.
- Verify that the required internal hardware is present and in good working condition.
- Verify that outstanding package issues have been cleared prior to release for loading.

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### 7.1.2 Loading Contents

- Raise shipping package to vertical position and secure in Traveller specific tooling.
- Open shipping package door and secure.
- Open top head.
- Open clamshell doors.
- Place the fuel assembly in the support frame.
- Close the clamshell doors and J clip closure.
- Secure the doors.
- Close and secure top closure assemblies.
- Check all fasteners for correct configuration.

#### 7.1.2.1 Inspection

- Verify that the fuel *assembly* and core component have been released and the proper component is being shipped with the assembly.
- Verify that the fuel *assembly is* properly oriented in the package.
- Verify the number of shock mounts is correct and accelerometers are sealed, calibrated and not tripped.
- Verify general cleanliness and absence of debris on package internals, fuel assembly, package shell lower subassembly prior to closing the package.
- Verify placement and integrity of shipping package gasket.

#### 7.1.2.2 Close Shipping Package

- Verify that the cover flange is free of debris and close overpack door.
- Tighten package closure fasteners to secure cover.
- Install one approved tamper proof security seal on each end of the package.

#### 7.1.2.3 Inspection

- Verify that the package lid is properly seated and all closure bolts are present.
- Verify that the required decals, license plates, labels, stencil markings, etc. are present and legible.

### 7.1.3 Preparation for Transport

#### 7.1.3.1 Truck Loading of Shipping Packages

- Place shipping package on trailer equipped to permit chaining down of package.
- Center and place package lengthwise on trailer.
- Secure packages to trailer bed with stops.
- Chain packages to trailer using “come along” tighteners and chains of 3/8 inch minimum diameter.

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### 7.1.3.2 Regulatory

- Conduct direct alpha surveys on both the packages and the accessible areas of the flatbed.
- Perform the removable alpha and beta-gamma external smear surveys on both the packages and the accessible areas of the flatbed. If any single alpha measurement exceeds 220 dpm/100 cm<sup>2</sup> or beta-gamma measurement exceeds 2200 dpm/100 cm<sup>2</sup>, notify Regulatory Engineering for instructions on decontamination.

### 7.1.3.3 Inspection

- Verify that packages are properly stacked and secured.
- Verify that required Health Physics, Radioactive and any other placards or labels have been properly placed.
- Verify that two tamper proof security seals have been properly placed on each package.

## 7.2 PACKAGE UNLOADING

### 7.2.1 Receipt of Package from Carrier

- Perform an external inspection of the unopened package and record any significant observations.
- Verify that two tamper proof security seals have been properly placed on each package. *If either seal is missing or damaged, record the damage and follow site procedures for possible security issues.*

### 7.2.2 Removal of Contents

- Raise shipping package to vertical position and secure in Traveller specific tooling.
- Open shipping package door and secure.
- Open top head.
- Open clamshell doors.
- Remove the fuel assembly from the support frame.
- Close the clamshell doors and J clip closure.
- Secure the doors.
- Close and secure top closure assemblies.
- Check all fasteners for correct configuration.

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**7.3 PREPARATION OF EMPTY PACKAGE FOR TRANSPORT**

- Verify the package is empty of contents.
- Verify radiation levels do not exceed *limits* prescribed in 49 CFR 173.421 (a) (2).
- Verify non-fixed radioactive surface contamination does not exceed *limits* prescribed in 49 CFR 173.421 (a) (3).
- Verify the package does not contain more than 15 grams of uranium-235.
- Verify the packaging is in unimpaired condition and is securely closed.
- Verify the internal contamination does not exceed 100 times *limits* prescribed in 49 CFR 173.428 (c).
- Remove any previously applied labels affixed for fuel shipments.
- Affix an “Empty” label.