



CONSOLIDATED SAFETY ANALYSIS REPORT

OP-100 Package

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7.0 OPERATING PROCEDURES

7.1 Procedure for Loading the Package

This section delineates the procedures for loading a payload into the OP-100 packaging. Hereafter, reference to specific OP-100 components may be found in Appendix 1.3.1, General Arrangement Drawings, *OP-100 Package*.

7.1.1 Preparation of the OP-100 for Loading

- 1) Visually inspect the OP-100 for damage and/or missing parts.
- 2) Visually inspect the device (i.e., IR-100 or IR-50) to be loaded into the OP-100.
- 3) Loosen and remove the closure ring bolt from the closure ring.
- 4) Remove the closure ring and the drum lid from the drum body.
- 5) Remove the two unsecured plywood cross members that allow a IR-100 or a IR-50 device to be positioned within the plywood support structure.
- 6) Remove the Safety Plug and the dust cover (IR-100) or the dust caps (IR-50). Check the threads for wear or damage.
- 7) Inspect the Lock Box for damage or missing set screws. Replace any damaged or missing set screws.
- 8) Prior to loading an active Ir-192 source into a IR-100, insert a dummy source pigtail and functionally test the automatic locking device to ensure that all components are operating properly. The IR-50 locking devices shall be checked prior to each use.
- 9) Pull (retract) the dummy pigtail. The Safety Latch Plate will pop-up and lock the dummy source in the stored position. Rotate the key to the locked position and remove the key.
- 10) Insert the key into the lock, retract (pull) the dummy source pigtail and rotate the key to the unlocked position. Manually depressed the Safety Latch Plate to the operate position and remove the dummy source pigtail.

7.1.2 Loading the Special Form Payload into the IR-100/IR-50

- 1) Place the special form Ir-192 source pigtail assembly into a source changer.
- 2) Connect the drive cable housing and the guide tube to the IR-100 device.
- 3) Crank the drive cable out through the guide tube and connect it to the Ir-192 source pigtail assembly. Connect the guide tube to the IR-50 device.
- 4) Unlock the IR-50 device and retract the Ir-192 source pigtail assembly into the IR-100 device.
- 5) Survey the package to ensure that the source is in the stored position. Rotate key to locked position and remove the key.
- 6) Disconnect drive cable and install the Safety Plug and dust cap (IR-100) or the dust caps (IR-50).
- 7) Install the Ir-192 source identification plate on the top of the IR-100 device.

- 8) When transported in a IR-50 device, attach the Ir-192 source identification plate to the tamper seal wire of the IR-50 device for transfer with the Ir-192 source to a IR-100 device.

7.1.3 Final Package Preparations for Transport

- 1) Install the two tamper-indicating seals (security wire/lead seals). For the IR-100 device, one tamper-indicating seal is located at the lock assembly; and the second is located at the Safety Plug. For the IR-50 device, the safety seals are located on each Lock Box and has a lock key attached.
- 2) Load the IR-100 or IR-50 device into the plywood support structure. Replace the two unsecured plywood cross members in their proper positions.
- 3) Replace drum lid.
- 4) Replace the closure ring and then the 5/8-inch × 4 inch closure ring hex bolt. As the hex bolt is tightened, ensure that the closure ring is fully seated around the circumference of the drum. Tighten the closure ring bolt to a snug tight condition.
- 5) Install the hex nut and tighten to a snug tight condition.
- 6) Install a tamper-indicating seal (security wire/lead seal) through the hex bolt.
- 7) Monitor external radiation per the guidelines of 49 CFR §173.441⁸.
- 8) Determine the shielding transport index for the loaded OP-100 package per the guidelines of 49 CFR §173.403.
- 9) Load the OP-100 onto the transport vehicle.
- 10) Complete all necessary shipping papers in accordance with Subpart C of 49 CFR 172⁹.
- 11) OP-100 package marking shall be in accordance with 10 CFR §71.85(c) and Subpart D of 49 CFR 172. Package labeling shall be in accordance with Subpart E of 49 CFR 172. Packaging placarding shall be in accordance with Subpart F of 49 CFR 172.

7.2 Procedures for Unloading the Package

This section delineates the procedures for unloading a payload into the OP-100 packaging. Hereafter, reference to specific OP-100 components may be found in Appendix 1.3.1, General Arrangement Drawings, *OP-100 Package*.

7.2.1 Removal of the Ir-192 Special Form from the OP-100 Package

- 1) Remove the OP-100 package from the transport vehicle.
- 2) Monitor the external radiation to ensure that the OP-100 package was not damaged during shipment. If Radiation readings or surface radioactive contamination levels exceed allowable limits contact the Radiation Safety Officer for instructions.

⁸ Title 10, Code of Federal Regulations, Part 173 (49 CFR 173), *Shippers-General Requirements for Shipments and Packagings*, 1-1-97 Edition.

⁹ Title 10, Code of Federal Regulations, Part 172 (49 CFR 172), *Hazardous Materials Tables and Hazardous Communications Regulations*, 1-1-97 Edition.

- 3) Remove the tamper indicating wire seal. If tamper indicating seal is missing or broken, call Radiation Safety Officer for instructions. The RSO will investigate the incident before preceding.
- 4) Remove the hex nut, closure ring hex bolt, the closure ring, and lid.
- 5) Remove the two unsecured plywood cross members and remove the device (i.e., IR-100 or IR-50 device).
- 6) Remove the Safety Plug and the dust cap (IR-100) or the dust caps (IR-50).
- 7) Connect the drive cable housing and the guide tube to the package. Connect the guide tube to a source changer.
- 8) Unlock the IR-100 and IR-50 devices and extend the Ir-192 source pigtail assembly into the IR-50 device.
- 9) Secure the Ir-192 source pigtail assembly in the IR-50 device, lock, and remove the key.
- 10) Disconnect the drive cable from the IR-50 device and retract it.
- 11) Disconnect the guide tube from the IR-50 and the IR-100 devices. Install the dust caps on the IR-50 device, and the Safety Plug and dust cap on the IR-100 device. Remove the source identification from the IR-100 device and install it on the IR-50 device.

7.2.2 Final Package Preparations for Transport of Unloaded OP-100

- 1) Complete all required shipping papers in accordance with Subpart C of 49 CFR 172.
- 2) OP-100 package marking shall be in accordance with 10 CFR §71.85(c) and Subpart D of 49 CFR 172. Package labeling shall be in accordance with Subpart E of 49 CFR 172. Packaging placarding shall be in accordance with Subpart F of 49 CFR 172.

7.3 Preparation of an Empty Package for Transport

Previously used and empty OP-100 packages shall be prepared and transported per the requirements of 49 CFR §173.426, Subpart I.