

Amersham Corporation

40 North Avenue
Burlington, Massachusetts 01803
Telephone (617) 272-2000

19 October 1990

Mr. Charles MacDonald, Chief
Transportation Branch
Division of Safeguards and
Transportation, NMSS
U.S. Nuclear Regulatory Commission
OWFN, 4E4
Washington, D.C. 20555

Dear Mr. MacDonald:

I have enclosed the additional information you requested concerning docket number 71-9141.

Item 5c has been corrected to USA.

Item 10 refers to the DOT labels, i.e. Yellow II or Yellow III that are placed on the shipment, and are described in table 1 in the instructions. Item 6 refers to the permanent metal nameplates that are attached to the package and are designed to withstand the fire test of Part 71.

The instructions have been revised to clarify the shipping of a package within a crate.

In Section 7.3, the instructions for shipping an empty package have been revised to require a physical verification that the container is empty prior to shipment.

The instructions have been clarified to indicate the shipping of a package or a package within an overpack.

A note has been added to clarify that the shipment is not exempt from all requirements of part 49 CFR 171-177.

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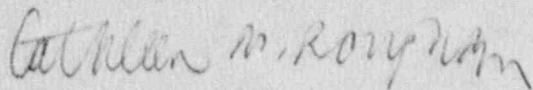
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Mr. MacDonald, Chief
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These changes have been submitted as revised pages. I trust this provides the necessary information to complete the review of our renewal request.

Please contact me if you require additional information.

Sincerely,



Cathleen M. Roughan
Radiation Safety Officer

CMR/bt

SECTION 7: MODEL 900 OPERATING PROCEDURES

NOTE: All the precautions used when making a radiographic exposure must be observed when loading or when unloading the package.

1. A calibrated and operable survey meter must be used at all times when loading or unloading this package.
2. Personnel dosimetry must be worn when loading or unloading the package.
3. For details on the operation and source changing procedures please refer to the instruction manual for the device which can be obtained from Amersham Corporation.

TECHNICAL SPECIFICATIONS

MODEL 900 EXPOSURE DEVICE

USNRC Type B Certificate	=	USA/9141/B(U)
Isotope	=	Ir-192
Capacity	=	100 Curies (+20%)
Authorized source assembly	=	90003
Gross Weight	=	44 lbs (20 kg)
Shielding	=	Depleted Uranium 29 lbs (13 kg)

Procedure For Loading the Package

1. Assure that the package is not damaged except for superficial marks or dents.
2. Assure the source is authorized for use in this container and is secured in the locked position.
3. To properly secure the source, the selector ring should be in the lock position, the dust cover must be installed and the key lock must be depressed with the key removed.
4. Install the shipping plug securely and apply a security seal with an identification mark through the shipping plug and front nut of the camera.
5. Assure all nameplates are clear and legible and contain the following information.
 - a. The words "Danger Radioactive Material" and the trefoil symbol.
 - b. The proper shipping name
Radioactive Material Special Form, N.O.S., UN2974
 - c. Package identification
USA/9141/B(U), Type B(U)
 - d. The radioactive contents.
6. If the shipping package is to be packaged inside a crate or other outer packaging, the outer packaging must be strong enough to withstand the normal conditions of transport and must not reduce the safety of the package. The shipping package must be placed within the outer package with sufficient blocking to prevent shifting during transportation.

NOTE: When using a crate or other outer packaging to ship the 900, steps 7-13 refer to the crate or outer packaging.

7. Survey the exterior surfaces of the package and assure that the maximum radiation level does not exceed 200 mrem/hr. Survey one meter from the exterior surfaces of the package and assure that the maximum radiation level does not exceed 10 mrem/hr. Determine the proper shipping labels to be applied to the package using the criteria of table 1.
8. Properly complete two shipping labels indicating the contents (Iridium-192), the activity of the source in curies or millicuries and the transport index. The transport index is the dimensionless number (rounded up to the first decimal place) expressing the maximum radiation level (in mrem/hr) measured at one meter from the package surface.
9. Assure that any old shipping labels have been removed from the package. Apply two properly completed labels to two opposite sides of the package.
10. Mark the outside of the package with the proper shipping name and identification number (Radioactive Material, Special Form, n.o.s., UN 2974) if not already marked. Place the letters RQ next to the proper shipping name.
11. If the shipping package is inside a crate or other outer packaging, mark the outside package "INSIDE PACKAGE COMPLIES WITH PRESCRIBED SPECIFICATIONS" and list the appropriate DOT specification number or USNRC Type B number and the words "TYPE B".
12. Assure that the levels of removable radioactive contamination on the outside surface of the outer package do not exceed 0.001 microcurie per 100 square centimeters.
13. Properly complete the shipping papers, indicating:
 - a. Proper shipping name and identification number (i.e. Radioactive Material, Special Form, n.o.s., UN 2974).
 - b. The letters RQ must appear next to the proper shipping name when shipping more than 10 curies of Ir-192 or Co-60.

- c. Name of the radionuclide (i.e. iridium-192).
- d. Activity of source in curies or millicuries.
- e. Category of label applied (i.e. Radioactive Yellow II).
- f. Transport Index.
- g. USNRC identification number or DOT specification number (i.e. USA/9141/B(U)).
- h. For export shipments, the IAEA identification number (i.e. USA/9141/B(U)).
- i. Shipper's Certification:

"This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation."

- j. The shipping papers must indicate an emergency phone number. This phone number must have 24 hour coverage in case of an emergency concerning your shipment. The phone number must be clearly visible on the shipping paper.
- k. For packages containing depleted uranium as shielding material, a notice must be enclosed in or on the package, included with the packing list or otherwise forwarded with the package. This notice must include the name of the consignor or consignee and the statement:

"This package conforms to the conditions and limitations specified in 49 CFR173.424 for excepted radioactive material, articles manufactured from depleted uranium UN 2909.

- 14. Place the package onto the vehicle using the handle of the camera.
- 15. Properly brace and secure the package against movement in the vehicle.

16. Assure that back of the vehicle is closed and secured so that it will not open during transport.

NOTES: 1. For air shipments, the following Shipper's Certification may be used:

"I hereby certify that the contents of the consignment are fully and accurately described above by proper shipping name and are classified packaged, marked and labeled and are in proper condition for carriage by air according to applicable national governmental regulations."

2. For air shipments, the package must be labeled with a "CARGO AIRCRAFT ONLY" label and the shipping papers must state:
"THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR CARGO AIRCRAFT ONLY".
3. For international shipments the activity must be given in Gigabecquerels on the DOT label and the shipping papers (curies X 37 = Gigabecquerels).

Procedure for Unloading the Package

- NOTES: a. A radioactive material package must be accepted from the carrier at the time it is delivered.
- b. If a radioactive material package is to be held at the carrier's terminal for pickup, arrangements must be made to receive notification from the carrier of the arrival of the package at the time of arrival. The package must be picked up expeditiously upon receipt of notification (within three hours if practicable).

1. Upon receipt of a package of radioactive material, survey the exterior surfaces of the package and assure that the maximum radiation level does not exceed 200 mrem/hr. Survey three feet from the exterior surfaces of the packages and assure that the maximum radiation level does not exceed 10 mrem/hr. If either of these limits are exceeded, notify the Radiation Safety Officer immediately. Record the maximum radiation levels measured at the package surface and at three feet from the package surface on the Receiving Report.
2. If the package contains radioactive material which is not in special form make a contamination wipe test of the exterior surface of the package. Wipe a representative surface of the package, covering an area of approximately 100 square centimeters, using a cloth patch and moderate pressure. Measure the activity of the patch using the contamination monitor and assure that the activity does not exceed 0.01 microcurie. If this limit is exceeded, notify the Radiation Safety Officer immediately. Record the results of this contamination wipe test on the Receiving Report.

NOTE: If any of these limits are exceeded, the Radiation Safety Officer shall immediately notify the USNRC and the final delivering carrier.

3. Inspect the package for any evidence of physical damage. Record the results of this inspection on the Receiving Report. Also record on the Receiving Report the source model number, source serial number, radionuclide, activity, transport package model number and package serial number. Forward a copy of the completed Receiving Report to the Radiation Safety Officer.
4. Assure that the package is locked, or place the package into an outer locked container. Place the package into the Radioactive Material Storage Room and lock the door to the room.

5. Keep a copy of the Operations Manual for the package on file to assure you have the proper opening instructions.
6. To properly open and use the package, as a radiographic device refer to the detailed instruction manual for this device.

Procedure for Preparation of an Empty Package for Transport

1. Assure that the package does not contain a radioactive source, by performing the following procedure:
 - a. Survey the device to assure radiation levels do not exceed approximately 2 mR/hr at the surface.
 - b. Due to the straight source tube of the 900 a physical verification can be performed by a visual check of the tube.
 - c. Remove the shipping plugs at both ends of the camera and assure there is no connector in the lock assembly. Visually verify there is no source within the tube.
 - d. Once the camera is determined to be empty, insert the shipping plugs and seal wire the front shipping plug. Attach an empty tag to the device and prepare the package for shipment based on the radiation levels obtained below.
2. If the shipping package is to be placed inside a crate or other outer packaging, the outer packaging must be strong enough to withstand the normal conditions of transport and must not reduce the safety of the package. The shipping package must be placed within the outer package with sufficient blocking to prevent shifting during transportation.

NOTE: When using a crate or other outer packaging to ship the 900, steps 3-4 refer to the outer packaging.

3. Assure that the levels of removable radioactive contamination on the outside surface of the outer package do not exceed 0.001 microcurie per 100 square centimeters.

4. Survey the package at the surface and at one meter from the surface to determine the proper shipping labels to be applied to package.
 - a. If the surface radiation level does not exceed 0.5 mrem/hr and there is no measurable radiation level at one meter from the surface, no label is required. Mark the outside of the package with the proper shipping name and identification number (Radioactive Material, Articles Manufactured from depleted Uranium, UN 2909) and the statement "EXEMPT FROM SPECIFICATION PACKAGING SHIPPING PAPER AND CERTIFICATION, MARKING AND LABELING AND EXEMPT FROM THE REQUIREMENTS OF 49CFR part 175 PER CFR173.421-1 AND 49 CFR173.424".

NOTE: This does not exempt the shipment from the reporting requirements listed in 49 CFR parts 171-177 pertaining to the reporting of the contamination or other radiation incidents.




Additionally, a notice must be enclosed in or on the package, included with the packing list or otherwise forwarded with the package. The notice must include the name of the consignor or consignee and the statement:

"This package conforms to the conditions and limitations specified in 49CFR173.424 for Exempted Radioactive Material, Articles Manufactured from Depleted Uranium, UN 2909".

- b. If the surface radiation level exceeds 0.5 mrem/hr, or if there is a measurable radiation level at one meter from the surface, use the criteria of table 1 in section 7.1 to determine the proper shipping labels to be applied to the package. Mark the outside of the package with the proper shipping name and identification number (Radioactive Material, LSA, n.o.s., UN 2912). If the container is packaged inside a crate or other outer packaging, mark the package with the statement "INSIDE PACKAGE COMPLIES WITH PRESCRIBED SPECIFICATIONS".

Properly complete the shipping papers, as listed in section 7.1. The isotope is U-238 and approximately 5 millicuries.

TABLE 1

	Maximum Radiation Level	
	at Surface	at One Meter
Radioactive White I 	0.5 mR/hr	None
Radioactive Yellow II 	50 mR/hr	1.0 mR/hr
Radioactive Yellow III 	200 mR/hr	10 mR/hr