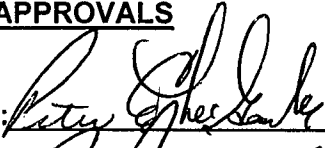
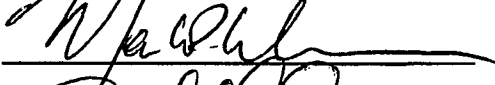



DOCUMENT REVISION STATUS

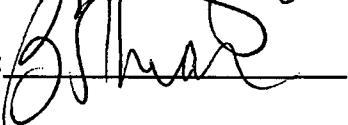
REVISION LEVEL	DESCRIPTION OF CHANGE	DATE	ECO #
-	INITIAL RELEASE	4/20/07	N/A
A	MODIFIED SECTION 2.1.6 AND ADDED SECTIONS 2.1.7 & 2.1.8. SEE ECO.	11/1/07	14754
B	REVISED FIGURE 1 & 2. SEE ECO.	5/27/09	15083
C	ADDED NOTE AFTER SECTION 2.1.8 AND UPDATED FIGURES 1 & 2. SEE ECO.	9/28/10	15342

APPROVALS

APPROVED: PROCESS ENGINEERING:  DATE: 9/28/10

APPROVED: ENGINEERING MANAGER:  DATE: 9/28/10

APPROVED: MANUFACTURING MANAGER:  DATE: 9-28-10

APPROVED: QUALITY ASSURANCE MANAGER:  DATE: 9/28/10



**1.0 PURPOSE:**

1.1 This document details how to safely and properly package, label and document devices being shipped out of the building that contain some amount of radioactive by-product material.

**2.0 PROCEDURE:**

2.1 The following steps must be performed upon notification from shipping department of receipt of device containing by-product material:

2.1.1 Inspect device for proper marking of RA Material.

2.1.2 After packaging device, but before sealing package, place "This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package-instruments or articles, UN 2911" insert on inside top of package. See Figure 3.

2.1.3 After package is sealed a wipe test must be performed on all exterior surfaces of the package. This wipe (smear) must then be analyzed using a liquid scintillation counter to ensure there is no external contamination of the package. These readings must be recorded in DPM and recorded on the "Information for Bill of Lading or Shipping Paper Form". See Figures 1 & 2.

2.1.4 After package is sealed, survey of the package must be performed using a calibrated survey meter. Take readings of all exterior surfaces of the package. The survey meter readings are to be recorded for maximum reading at surface and at 3 feet from the surface in MR/HR and recorded on the "Information for Bill of Lading or Shipping Paper Form". See Figures 1 & 2.

2.1.4.1 The maximum levels allowed for surface contamination on a package surface are 22dpm/cm<sup>2</sup>.

2.1.5 The package must be labeled per the requirements defined in Table I below.

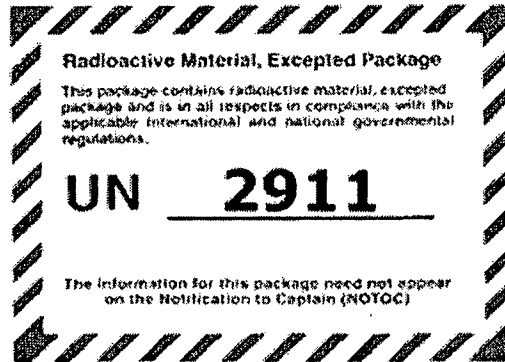
Table I: Labeling Guide

Label Required	Dose Rate Limits Reading on external surface	Reading at 3 feet
NO LABEL excepted quantity	Less than 0.005mSv/h (0.5mrem/h)	N/A
WHITE – I	Less than or equal to 0.005mSv/h (0.5mrem/h)	N/A
YELLOW – II	Greater than 0.005mSv/h (0.5mrem/h) but less than or equal to 0.5mSv/h (50mrem/h)	1.0mrem/h
YELLOW – III	Greater than 0.5mSv/h (50mrem/h) but less than or equal to 2mSv/h (200mrem/h)	10.0mrem/h

2.1.6 Affix a shipping label envelope to the accepted package. Seal the "Information for Bill of Lading Form" inside the shipping label envelope.

2.1.7 Sealed, wiped, surveyed boxes which will be shipped by ground transportation and contain more than 27mCi of (H3) Tritium and/or 2.7uCi of (CO60) Cobalt 60 (not to exceed 1 Curie per box of either Cobalt 60 or H3 Tritium for Limited Quantity) must be marked (stamped) with "UN 2911" For Radioactive Material Excepted Package – Instruments or Articles, specified in 49 CFR 173.424 "UN 2911".

- 2.1.8 Sealed wiped surveyed boxes which will be shipped by air transportation and contain (H3) Tritium and/or (CO60) Cobalt 60 must have the following label affixed to the top or side of the package:



Once all labeling wipes and forms are finished; notify shipping that package is cleared to be shipped.

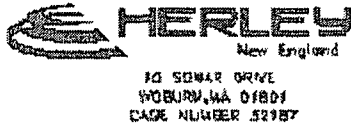
**NOTE:** Items contained within this package are in compliance with all NRC Regulations for the Transfer of exempted devices containing by-product materials per 10CFR 30.15. Any additional notification of appropriate state agencies is the sole responsibility of the end user.



**PROCESS SPECIFICATION  
SHIPMENT OF DEVICES CONTAINING  
BY-PRODUCT MATERIAL**

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**Figure 1: Information for Bill of Lading or Shipping Papers (Cobalt 60 – CO<sup>60</sup>)**



**COBALT 60 – CO<sup>60</sup>**

**QCF-184  
REV. B  
SEPTEMBER, 2010**

**EXCEPTED PACKAGE INSTRUMENTS AND ARTICLES  
Information for Bill of Lading or Shipping Papers**

<b>FURTHER DESCRIPTION OR MATERIAL:</b>	Excepted Instruments
<b>TRANSPORT GROUP:</b>	UN 2911
<b>FISSILE CLASS:</b>	N/A
<b>CONTAINER SPEC. DESIG.:</b>	INDUSTRIAL (Fiberboard Box)
<b>LABELS REQUIRED:</b>	SEE NOTE 1
<b>PLACARDS REQUIRED:</b>	No
<b>REFERENCE:</b>	N/A

**SHIPPER'S CERTIFICATION:** This shipment is within the limitations prescribed for passenger carrying aircraft. This is to certify that the above named articles are properly described by name, are packed and marked and are in proper condition for transportation according to the regulations prescribed by the Department of Transportation and IATA.

OUTER PACKAGE mark UN 2911 by ground. By Air Transport use label UN 2911 "Radioactive Material--Excepted Package". Inner Package must be marked "Radioactive".

- NOTE 1A:** No Label Required <0.5mr/hr @ Surface  
**NOTE 1B:** 1 Bar Label (White) 0.5mr/hr @ Surface N/A @ 3ft.  
**NOTE 1C:** 2 Bar Label (Yellow) <50mr/hr @ Surface <1.0mr/hr @ 3ft.

Signed By: \_\_\_\_\_

**GENERAL SHIPPING INFORMATION**

Emergency Contact Number CHEMTREC 800-424-9300

To Be Shipped To: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Ship Via: \_\_\_\_\_ Motor Freight  
 \_\_\_\_\_ Air Freight  
 \_\_\_\_\_ Air Express  
 \_\_\_\_\_ Motor Freight EXCLUSIVE USE  
 \_\_\_\_\_ Rail Express  
 \_\_\_\_\_ Other \_\_\_\_\_

Radiation Survey: \_\_\_\_\_ MR/HR at Surface  
 \_\_\_\_\_ MR/HR at 3 feet

For Air Shipment, Check One:  
 \_\_\_\_\_ Cargo Aircraft Only  
 \_\_\_\_\_ Passenger or Cargo Aircraft

Contamination: \_\_\_\_\_ DPM  
 Transportation Index Assigned: \_\_\_\_\_  
 based on X Radiation or \_\_\_\_\_ Fissile II  
 (CO<sup>60</sup>) Cobalt 60 uCi per device

Date Shipped: \_\_\_\_\_ File Ref: \_\_\_\_\_

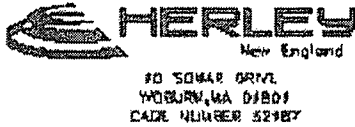
**NOTE:** Items contained within this package are in compliance with all NRC Regulations for the Transfer of exempted devices containing by-product materials per 10CFR 30.15. Any additional notification of appropriate state agencies is the sole responsibility of the end user.



PROCESS SPECIFICATION  
SHIPMENT OF DEVICES CONTAINING  
BY-PRODUCT MATERIAL

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Figure 2: Information for Bill of Lading or Shipping Papers (Tritium – 3H)



**TRITIUM – 3H**

QCF-183  
REV. B  
SEPTEMBER, 2010

**EXCEPTED PACKAGE INSTRUMENTS AND ARTICLES**  
**Information for Bill of Lading or Shipping Papers**

<b>FURTHER DESCRIPTION OR MATERIAL:</b>	Excepted Instruments
<b>TRANSPORT GROUP:</b>	UN 2911
<b>FISSILE CLASS:</b>	N/A
<b>CONTAINER SPEC. DESIG.:</b>	INDUSTRIAL (Fiberboard Box)
<b>LABELS REQUIRED:</b>	YES
<b>PLACARDS REQUIRED:</b>	No
<b>REFERENCE:</b>	N/A

**SHIPPER'S CERTIFICATION:** This shipment is within the limitations prescribed for passenger carrying aircraft. This is to certify that the above named articles are properly described by name, are packed and marked and are in proper condition for transportation according to the regulations prescribed by the Department of Transportation and IATA.

OUTER PACKAGE mark UN 2911 by ground. By Air Transport use label UN 2911 "Radioactive Material--Excepted Package".

INNER PACKAGE must be marked "Radioactive".

Signed By: \_\_\_\_\_

**GENERAL SHIPPING INFORMATION**

Emergency Contact Number CHEMTREC 800-424-9300

To Be Shipped To: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Ship Via:

- Motor Freight
- Air Freight
- Air Express
- Motor Freight EXCLUSIVE USE
- Rail Express
- Other \_\_\_\_\_

Radiation Survey:

MR/HR at Surface  
 MR/HR at 3 feet

For Air Shipment, Check One:

- Cargo Aircraft Only
- Passenger or Cargo Aircraft

Contamination: \_\_\_\_\_ DPM

Transportation Index Assigned:

based on  Radiation or  Fissile II

(H3) Tritium mCi per device

Date Shipped: \_\_\_\_\_

File Ref: \_\_\_\_\_

**NOTE:** Items contained within this package are in compliance with all NRC Regulations for the Transfer of exempted devices containing by-product materials per 10CFR 30.15. Any additional notification of appropriate state agencies is the sole responsibility of the end user.



Figure 3: By-Product Material Insert

Herley New England  
10 Sonar Drive  
Woburn, MA.  
-01801-

**“This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material , excepted package-instruments or articles, UN 2911” ;**

Radiation Safety Officer