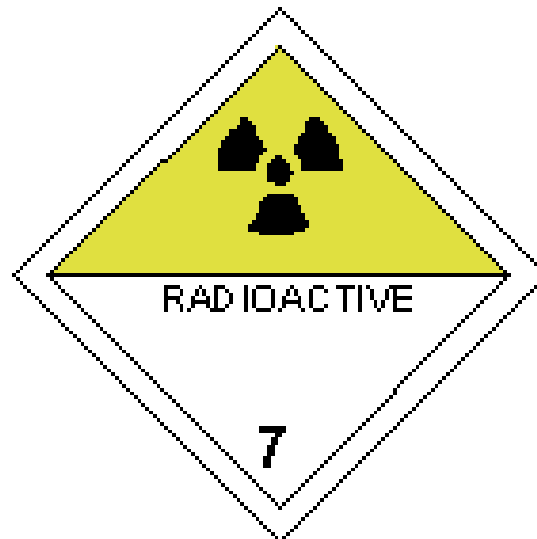


UNIVERSITY OF OTTAWA

# Transportation of Dangerous Goods Class 7 Guide



**This material is distributed for training purposes and is not meant to replace or interpret applicable legislation or to be relied upon as a procedure suitable for other organizations**

**By: Ali Shoushtarian  
Date: April 29, 2011**

<b>Date Issued:</b> <b>December 1, 2010</b>	<b>Page No.:</b> <b>2</b>	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

---

## **Table of Contents**

<b>Section</b>	<b>Page</b>
1.0 Introduction	3
2.0 Regulatory Requirements	3
3.0 Definitions	3
4.0 Training Requirements	5
5.0 Authorization Requirements	5
6.0 Units of Measurement	5
7.0 Package Type	6
8.0 Excepted Package	7
8.1 What Is An Excepted Package?	7
8.2 Packaging Your Radioactive Material	7
8.3 Markings and Labels	8
8.4 Documentation	9
9.0 Type A package	9
9.1 What Is Type A Package?	9
9.2 Packaging Your Radioactive Material	10
9.3 Markings and Labels	11
9.4 Placards	14
9.5 Documentation	15
9.6 Emergency Response Assistance Plan (ERAP) Requirements	16
References	16
APPENDIX 1: Radionuclide Commonly Used At University Of Ottawa	17
APPENDIX 2: The Training Requirements For Transporting Of Radioactive Materials.	18
APPENDIX 3: An Example Of FedEx Expanded Service International Air Waybill	19
APPENDIX 4: Excepted Package “Checklist”	20
APPENDIX 5: Type A Package “Checklist” (Air)	22

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 3	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

## 1.0 INTRODUCTION

The Transport of Dangerous Goods Act (1992) is federal legislation designed to regulate the movement of dangerous goods via roads, rail, air, and ship. **This guide is written in support of the mandatory training and authorization to transfer.** The regulations provide for different type of packages to be used depending upon the nature, physical form and activity of the radioactive material. The types of packages used for the transport of radioactive materials are Excepted package, Industrial package, Type A package, Type B(U) and Type B(M) package. This guide only address excepted packages and Type A packages. For other types of packages please contact the Radiation Compliance Specialist. This guide does not apply to radioactive material below exemption value (Appendix 1).

## 2.0 REGULATORY REQUIREMENTS

The transportation of radioactive materials is regulated under the following regulations and all requirement outlined in the below stated regulation must be complied with:

- the Transportation of Dangerous Goods (TDG) Regulations (link: <http://www.tc.gc.ca/eng/tdg/clear-tofc-211.htm>) and
- Canadian Nuclear Safety Commission (CNSC) the Packaging and Transport of Nuclear Substances Regulations (PTNSR) (link: <http://laws.justice.gc.ca/PDF/Regulation/S/SOR-2000-208.pdf>)
- The International Atomic Energy Agency's (IAEA) Safety Standards Series TS-R-1 1996. Note: this 1996 version must be used as it has been prescribed in the CNSC-PTNSR. (Link: [http://www-pub.iaea.org/mtcd/publications/pdf/pub1194\\_web.pdf](http://www-pub.iaea.org/mtcd/publications/pdf/pub1194_web.pdf))
- The Air Transport Association (IATA) 51<sup>th</sup> edition (Link : <http://www.iata.org/Pages/default.aspx>)

## 3.0 DEFINITIONS

*Note: To avoid confusion, the terminology used in the TDG, IAEA and CNSC-PTNSR Regulations will be used in this document. Thus the common term of “receive/ship” will be replaced with “handle, offer to transport”.*

A1, the activity value of Special Form radioactive material and is used to determine the activity limits for excepted and Type A packages.

A2, the activity value of radioactive material, other than Special Form radioactive material, and is used to determine the activity limits for excepted and Type A packages.

*Becquerel:* (symbol Bq) is the International System unit of radioactivity, equal to one nuclear decay or other nuclear transformation per second (1 Bq =27 pCi)

*Carrier:* means a person who has possession of dangerous goods while they are in transport

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 4	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

---

*Consignee:* initial person who receives a consignment of dangerous goods

*Consignor:* means a **person** in Canada who

- (a) is named in a **shipping document** as the consignor;
- (b) **imports** or who will **import dangerous goods** into Canada; or
- (c) if paragraphs (a) and (b) do not apply, has possession of **dangerous goods** immediately before they are **in transport**. *A person may be both a consignor and a carrier of the same consignment, for example, a manufacturer who also transports the dangerous goods he or she produces.*

*Dangerous Good:* A product, substance or organism included by its nature or by the TDG regulations in any of the classes listed in the schedule of the act.

*ERAP:* Emergency Response Assistance Plan is required for quantities exceeding those listed in column 7 of schedule 1 of the TDG Clear Language Regulations

*Handling:* means loading, unloading, packing or unpacking dangerous good means of containment for the purposes of, in the course of or following transportation and includes storing them in the course of transportation.

*IAEA:* International Atomic Energy Agency

*IATA:* International Air Transportation Association

*ICAO:* International Civil Aviation Organization

*Offer for Transport:* means, for **dangerous goods not in transport**, to select or allow the selection of a **carrier** to transport the **dangerous goods**, to prepare or allow the preparation of the **dangerous goods** so that a **carrier** can take possession of them for transport or to allow a **carrier** to take possession of the **dangerous goods** for transport

*Over-pack:* An enclosure such as a box or bag which is used by a single consignor to facilitate as a handling unit a consignment of one or more packages for convenience of handling, stowage and carriage.

*Special form radioactive material:* mean either an indispensable solid radioactive material or a sealed capsule containing radioactive material.

*State variations:* some States (countries) and airlines use their right to be more restrictive than the IATA instructions. These restrictions are filed with IATA as Variations.

*Transport Index (TI):* is a dimensionless number expressing the maximum radiation level measured at one meter from any external surface of the package.

*Radioactive material:* contains unstable atom that give off ionizing radiation. Unstable atoms differ from stable atoms because unstable atoms have an excess of energy or mass or both. Atoms with unstable nuclei are said to be **radioactive**. In order to reach stability, these atoms give off, or emit, the excess energy or mass. These emissions are called **radiation**.

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 5	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

#### 4.0 TRAINING REQUIREMENTS

TDG training has been developed to be as task specific as possible. Therefore, the following courses are provided.

The following table shows types of training offered at University of Ottawa:

Type of personnel	Training required
Radioactive users who handles radioactive materials	Radiation Safety Training- encompasses TDG regulation as this pertains to lab personnel.
Shipping and receiving personnel	TDG general awareness- for those individuals who facilitate the transfer of radioactive material between the lab personnel and receive the delivery of class 7 packages from the carrier.
Offering for transport of class 7 radioactive materials	TDG Class 7 training- for those who knows the characteristics of material to be shipped, are responsible for packaging and preparing the documents for transport.

Register for the above training courses via ORM training web page

<http://www.uottawa.ca/services/ehss/register.htm>

#### 5.0 AUTHORIZATION REQUIREMENTS

- Authorization to transfer radioactive materials **MUST** be obtained from Radiation Compliance Specialist by contacting Ali Shoushtarian, at extension 3057 or by e-mail: [ashousht@uottawa.ca](mailto:ashousht@uottawa.ca)
- Failure to obtain these authorizations may result in your shipment being stuck in customs, seized and the violation of regulatory requirements.

#### 6.0 UNITS OF MEASUREMENT

By international agreement, Becquerel units must be used. The unit of measure in Canada for the activity is the SI unit "Becquerel (BQ)". (Note: 1 millicurie (mCi) = 37 megabecquerel (MBq))

## 7.0 PACKAGE TYPE

The activity levels engaged at University of Ottawa usually mean either an excepted package or Type A package may be considered.

Table 1: Activity Limits Of Excepted Package And Type A Packages For Common Nucleotides.

Nuclide	Excepted package Activity (MBq)			Type A package Activity (MBq)		
	Solid		Liquid (A <sub>2</sub> )	Solid		Liquid (A <sub>2</sub> )
	<i>Special form</i> <sup>*</sup>	Other Forms (A <sub>2</sub> )		<i>Special form</i> <sup>*</sup> (A <sub>1</sub> )	Other forms (A <sub>2</sub> )	
H-3	40	40	4	40000	40000	40000
C-11	1	0.6	0.06	1000	600	600
C-14	40	3	0.3	40000	3000	3000
Na-22	0.5	0.5	0.05	500	500	500
N-13	0.9	0.6	0.06	900	600	600
P-32	0.5	0.5	0.05	500	500	500
S-35	40	3	0.3	40000	3000	3000
Cr-51	30	30	3	30000	30000	30000
Co-57	10	10	1	10000	10000	1000
Co-60	0.4	0.4	0.04	400	400	400
I-123	6	3	0.3	6000	3000	3000
I-125	20	3	0.3	20000	3000	3000
F-18	1	0.6	0.06	1000	600	600
Cs-137	2	0.6	0.06	2000	600	600
Tc-99m	10	4	0.4	10000	4000	4000
Gd-153	10	9	0.9	10000	9000	9000

\**Special form* radioactive material shall mean either an indispensable solid radioactive material or a sealed capsule containing radioactive material.

An excepted package is the configuration that is subject to the least amount of regulation due to the low levels of activity (see section 8).

Type A packaging is used to transport small quantities of radioactive material which exceed the limits set for excepted packages (see section 9).

Note: If activity for your radionuclide exceeds the limit for Type A package you must call Ali Shoushtarian as more stringent requirements and packaging are required (i.e. Type B package).

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 7	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

## 8.0 EXCEPTED PACKAGE

### 8.1. What Is An “Excepted Package”?

Is a package that is used to transport radioactive material with extremely low levels of radioactivity (see Table 1). A sturdy container (cardboard box, wooden crate, etc.) can be used as packaging for an excepted package. The container must be able to withstand normal transportation forces (hard acceleration or breaking) and be suitable for the size and mass of the content. The content must be packed in such a manner that any radiation warning symbols be clearly visible upon opening.

### 8.2 Packaging Your Radioactive Material

- The packaging must protect the material from damage during shipping. A leak-proof container should be used inside a outer container. Both primary and secondary container should be designed to prevent loss of content. Some filling material (paper, styrofoam chips) must be used to keep the primary container stationary in position during transportation.
- Excepted packages must meet the following provisions:
  1. The radiation level at any point on the external surface of the completed package must not exceed 5  $\mu\text{Sv/h}$
  2. The outer package must be marked with the contents’ UN number and the consignor and the consignee on a side  
For excepted packages these are:
 

UN2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING
UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM
UN2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL
UN2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or ARTICLES
  3. If the gross mass of the package exceeds 50 kg, the weight must be marked on the outside of the package.
  4. Shipping documents or waybill (please see below for an example) must accompany the package
  5. Contamination limits must be 4  $\text{Bq/cm}^2$  for beta/gamma & low toxicity alpha emitters, and 0.4  $\text{Bq/cm}^2$  all other alpha emitters. Package contamination level may be averaged over a maximum of 300  $\text{cm}^2$

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 8	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

### 8.3 Markings and Labels

The following labels are required:

#### Inner Container:

A radioactive label is required on the inner container. As well a label indicating the radionuclide, activity and assay date is also required.

#### **An example of Inner Container Label**

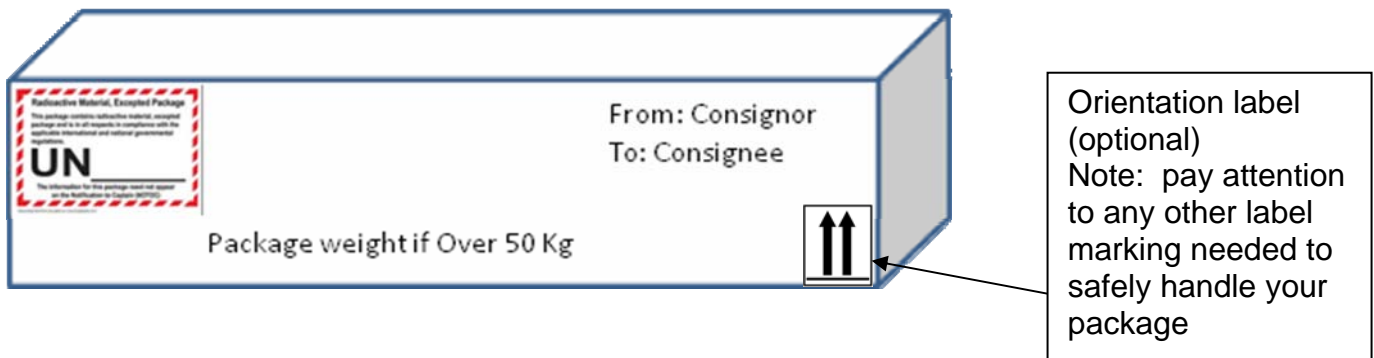


#### The outer container:

- A “Radioactive Material, Excepted Package” label is required (available from ORM)

<b>Radioactive Material — Excepted Package (shipping by Air)</b>	<b>Radioactive Material — Excepted Package (shipping by Ground)</b>
	<div style="border: 1px solid black; padding: 10px;"> <p>Radioactive Material, Excepted Package-Limited Quantity of Material</p> <p>UN 2910</p> </div>

#### **An example of Package labeling of an excepted package (shipping by Air):**



<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 9	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

## 8.4 Documentation

Shipping documentation requirements are met by either using the University of Ottawa ground shipping document (link: <http://www.uottawa.ca/services/ehss/tdg.htm>) or should the carrier waybill meet the content required, it too can be used. This is a case for Fed-Ex and Purolator (see Appendix 3 for an example of FedEx Expanded Service International Air Waybill). Please check with the Radiation Compliance Specialist if you are going to using a different carrier.

A consignor must keep a copy of any shipping document for two years after the date the shipping document.

A copy of the documentation must be provided to Radiation Compliance Specialist in order to maintain inventory integrity for CNSC review.

## 9.0 TYPE A PACKAGING

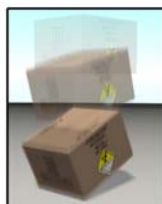
### 9.1 What Is Type A Package?

Type A package is the most commonly encountered type of package used to transport radioactive materials. It is used to transport low levels of activities of radioactive material (refer back to Table 1 that outlines the activity limits of Type A package). If activity for your radionuclide exceeds the limit for Type A package you must call Radiation Compliance Specialist, Ali Shoushtarian as more stringent requirements and packaging are required.

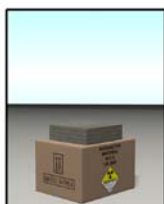
Type A Package must be able to withstand a series of tests that simulate normal transport conditions. The package must be UN certified. The following are the criteria that Type A package must meet:



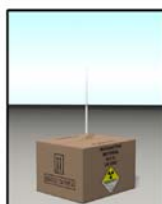
**WATER**  
Water spray for 1 hour to simulate rainfall of 2 inches per hour.



**DROP**  
Free drop test onto a flat, hard surface. This test is conducted only on packages weighing 11,000 pounds or less.



**STACKING**  
Stacking test of at least 5 times the weight of the package. This test is conducted for at least 24 hours.



**PENETRATION**  
Penetration test by dropping a 13-pound, 1.25-inch diameter bar vertically onto the package from a height of 3.3 feet.

Type A packaging and its radioactive contents must meet standard testing requirements designed to ensure that the package retains its containment integrity and shielding under normal transport conditions. Type A Packages must withstand moderate degrees of heat, cold, reduced air pressure, vibration, impact, water spray, drop, penetration, and stacking tests. Type A Packages are not, however, designed to withstand the forces of an accident. Type A packaging are only used to transport non life-endangering amounts of radioactive material.

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 10	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

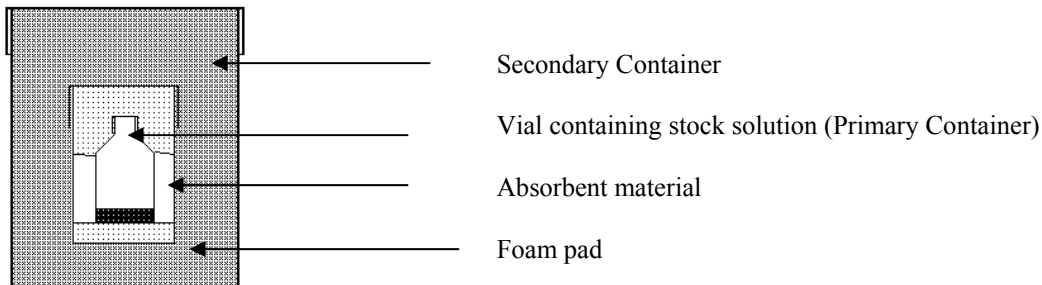
Type A Package must meet the following provisions:

1. Any lifting attachments on the package will not fail when used in the intended manner.
2. Any lifting attachments on the package will support the intended weight.
3. The package is free of protruding features and can be easily decontaminated.
4. The package will not collect or retain water on its outer layer.
5. Will have external dimension of at least 10 cm

Type A Package must be purchased from a certified company. Contact your Radiation Compliance Specialist to providing you with names of certified companies.

## 9.2 Packaging Your Radioactive Material

The packaging must protect the material from damage during shipping. A leak-proof container should be used inside an outer container. Both primary and secondary container should be designed to prevent loss of content. Some filling material (paper, styrofoam chips) must be used to keep the primary container stationary in center position during transportation. (An example is shown below).



The radiation level at any point on the external surface of the completed package must not exceed 2 mSv/h. If the TI index is not the same all around the external surface that might be an indication the radioactive material is not placed in the center; it may indicate movement of material during transport and potentially leakage of material.

Contamination limits must be  $4 \text{ Bq/cm}^2$  for beta/gamma & low toxicity alpha emitters, and  $0.4 \text{ Bq/cm}^2$  all other alpha emitters. Package contamination level may be averaged over a maximum of  $300 \text{ cm}^2$ .

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 11	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

---

### 9.3 Markings and Labels

Each package, which conforms to a Type A packaging design, shall be marked legibly and durably on the outside of the package the following information:




- a) Shipping name (s)
- b) UN number

The UN numbers and proper shipping names that apply to Type A packages as written:

UN2915 RADIOACTIVE MATERIAL, TYPE A PACKAGE  
UN 3327 RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE  
UN3332 RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM  
UN3333 RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE

- c) Name and address of the consignor and consignee (also include person and institution)
- d) The permissible gross weight (if it exceeds 50 kilograms)
- e) Name of manufacturer, or other packaging identification specified by the competent authority
- f) Type A
- g) The identification mark allocated to that design by the competent authority (i.e. certificate of approval number) For example –USA/9283/A-85
- h) For exterior labeling on the package, one of the 3 hazardous labels must be used (see Table 2 next page), must be plainly marked by permanent means, resistant to effects of fire and water on the outer most surface. The regulation requires that if the dangerous goods are included in Class 7, Radioactive Materials, **two labels** must be displayed in the small means of containment for the primary class. The labels must be displayed on **two opposite sides** of the outer surface of the small means of containment, other than the side on which it is intended to rest or be stacked during transport.

Table 2: Summary Of The Hazardous Label

Type of labels	Category Type	Transport Index	Max dose rate on package surface
	White - I	0	Surface dose rate $\leq 5 \mu\text{Sv/hr}$
	Yellow - II	Transport index $\leq 1.0$	$5 \mu\text{Sv/hr} < \text{Package surface} \leq 500 \mu\text{Sv/hr}$
	Yellow- III	$> 1.0$ Transport index $\leq 10$	$> 500 \mu\text{Sv/hr}$ Package surface $\leq 2 \text{ mSv/h}$

Information required on hazardous label:

- Contents, the symbol of the radionuclide.
- Activity- in Bq
- For category II and III yellow labels **only**, the “Transport Index” which must be rounded up to the first decimal place.



Information required on packaging label:

- Name and address of the consignor and consignee
- Hazardous label (two labels on opposite sides, not on top or bottom of the package)
- Type A package and Standardized UN certification number
- UN number



Note: Receipt of radioactive packages may display different organization or state variant labels (see Table 3 below)

Table 3: Examples of different organization marking requirement:

IATA	IATA	state variant (US)	ICAO
Cargo Aircraft Only	Package Orientation	Reportable Quantity (RQ) For a given substance, the minimum quantity that would adversely affect the environment significantly enough to warrant reporting. (US department of transportation 49CFR regulations)	Limited quantities of dangerous goods may be marked to indicate that the shipper has determined that the package meets the applicable air transport requirements.

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 14	<b>Document No.:</b> X 19-018-001
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Goods Class 7</b>	

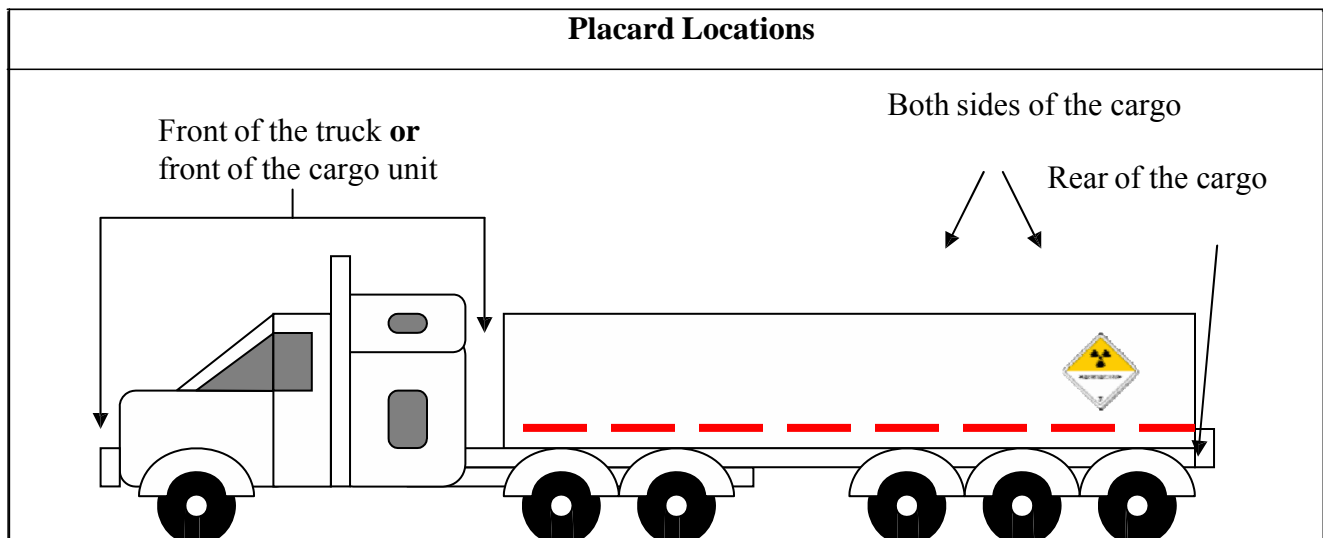
## 9.4 Placards

When transporting Class 7, Radioactive Materials, a placard and UN number must be displayed on the transport vehicle (i.e. truck) if the dangerous goods:



- are in a quantity or concentration for which an Emergency Response Assistance Plan is required;
- are included in Class 7, Radioactive Materials, for which a Category III Yellow Label is required;
- have a gross mass greater than 500kg.

If the truck contains radioactive material and placards are required to be displayed, then the consignor is responsible for insuring that placards are used and should the carrier not have the placards, the consignor must provide them to the carrier.

Placards must be displayed on each side and each end of truck. They may be displayed on a frame that is permanently connected to the truck. The placard may also be placed at the front of a truck instead of on the leading end of a trailer unit of the truck. The placards must be visible from all four sides of the truck, or moved to an appropriate position where they are visible.



Labels and placards must be displayed “square on a point”. That is, resting on a corner rather than on a side. The example below shows the proper orientation.

<b>Safety Mark Orientation</b>	
Correct	Incorrect
	

### 9.5 Documentation

Shipping documentation requirements are met by either using the University of Ottawa ground shipping document (if ship by ground)

(link: <http://www.uottawa.ca/services/ehss/documents/SHIPPINGDOCv1.pdf>) or by

the Shipper's Dangerous Goods Declaration (if ship by air)

(link: <http://www.uottawa.ca/services/ehss/documents/ShippersDeclarationAirfillable.pdf>)

Two copies must accompany the package and one copy should be kept for your records.

IATA requires the consignor to keep a copy of any shipping document for two years after the date the shipping document.

In addition, the carrier waybill must be completed. This is a case for Fed-Ex and Purolator (see an example of FedEx Expanded Service International Air Waybill in Appendix 3). In addition, check with other carriers to determine companies' specific requirements. For example, FedEx requires all dangerous goods declaration forms to be typed or computer generated. Please check with the Radiation Compliance specialist if you are going to use a different carrier.

**Important Note:** A copy of the documentation must be provided to Radiation Compliance Specialist in order to maintain inventory integrity for CNSC review.

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 16	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

---

## **9.6 Emergency Response Assistance Plan (ERAP) Requirements**

An emergency response assistance plan (ERAP) is required and must be approved by Transport Canada (link: <http://www.tc.gc.ca/eng/tdg/clear-part7-374.htm>).

Office of Risk Management (ORM) is responsible to develop and register for an ERAP. Failure to obtain these authorizations may result in your shipment being stuck in customs, seized and the involvement of regulatory bodies.

The object of an emergency response assistance plan is to ensure that there is immediate response available to emergency situations involving the radioactive materials for which the plan was created. Under the PTNS and the TDG Regulations, the shipper must have measures in place to respond in the event of an emergency involving the transport of their radioactive material. In addition, the TDG Regulations require the shipper to display a 24-hour emergency telephone number on the shipping document that accompanies a shipment of dangerous goods. The PTNS Regulations require that all incidents be immediately reported to the CNSC and a full report must be submitted within 21 days.

## **REFERENCES**

- 1) Canadian Nuclear Safety Commission, Nuclear Safety and Control Act, Ottawa, 1997, [www.nuclearsafety.gc.ca](http://www.nuclearsafety.gc.ca)
- 2) Canadian Nuclear Safety Commission, Radiation Protection Regulations, SOR/2000-203, Ottawa, 2000, [www.nuclearsafety.gc.ca](http://www.nuclearsafety.gc.ca)
- 3) Canadian Nuclear Safety Commission, Packaging and Transport of Nuclear Substances Regulations, SOR/2000-208, Ottawa, 2000, [www.nuclearsafety.gc.ca](http://www.nuclearsafety.gc.ca)
- 4) Government of Canada, Transportation of Dangerous Goods Regulations, SOR/2002-306, 2002, [www.canada.gc.ca](http://www.canada.gc.ca)
- 5) International Atomic Energy Agency, Regulations for the Safe Transport of Radioactive Material, 2009, Vienna, [www.iaea.org](http://www.iaea.org)

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 17	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

---

**APPENDIX 1: Radionuclide Commonly Used At University Of Ottawa.**

Common Radionuclide	Activity Concentration for exempt material		Activity limit for an exempt consignment	
	Bq/g	uCi/g	Bq	uCi
C-14	10000	0.27	10000000	270
Cl-36	100000	0.27	1000000	27
Co-60	10	0.0002	100000	2.7
I-125	1000	0.02	1000000	27
Na-22	10	0.0002	1000000	27
H-3	1000000	27	100000000	2700
S-35	100000	2.7	10000000	270
P-32	1000	0.02	100000	2.7


If your radioisotope is not listed in Appendix 1 please contact Radiation Compliance Specialist.

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 18	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

**APPENDIX 2: The Training Requirements For Transporting Of Radioactive Materials.**

<b>Lists</b>	<b>Regulation</b>
Anyone who handles, offers for transport or transports dangerous goods must be adequately trained and have a valid Dangerous Goods Training Certificate	TDG, Section 6.1
A person is required to be knowledgeable of the topics listed below: <ul style="list-style-type: none"> <li>• classification of dangerous goods, shipping names, UN numbers, packing groups;</li> <li>• schedules 1, 2 and 3</li> <li>• shipping documentation;</li> <li>• safety marks;</li> <li>• certification safety marks, safety requirements and safety standards;</li> <li>• emergency response assistance plan requirements;</li> <li>• reporting requirements;</li> <li>• safe handling and transportation practices, including characteristics of dangerous goods;</li> <li>• proper use of equipment; and</li> <li>• emergency measures to take in case of releases.</li> </ul>	TDG, Section 6.2
The employer must keep a record of training and a copy of a training certificate from the date the training certificate was issued until two years after it expires	TDG, Section 6.6
The training certificate must be immediately presented to an inspector who requests for it	TDG, Section 6.8

APPENDIX 3: An Example Of FedEx Expanded Service International Air Waybill



**1** From: 10/15/01 Atlanta 9999-9999-9

Shipper: Mrs. D'Abate Phone: (214)555-1426

Company: Software alists inc.

Address: 249 Walnut Lane

City: Dallas State: TX

Country: USA Zip: 75229

---

**2** To: Lin Roth Phone: 393-555-209

Company: The Fuller Company

Address: 43 wellin wurt

City: Brighton Road State: West Sussex

Country: UNITED KINGDOM Postcode: BN119BP

Requires Post Insurance for Customs Purposes: V.A.T. 333 4444 22

---

**3** Shipment Information

Description	Net Weight	Gross Weight	Volume	Value
Software	1	30		4901.9
Manuals				9.0050
COMPLETED IN FULL				

Total Weight: 30 Total Volume: 1400

Insurance: 4800 (USA)

Sender's Copy

*The World On Time.*

Not all services and options are available in all destinations.

**4** Express Package Service:  Priority Mail **4**  International Economy

**5** Packaging:  FedEx **5**  FedEx  FedEx  Other

**6** Special Handling:  Fragile  High Value  Large Parcel  Other

**7** Payment Information:  Prepaid  Collect  Cash  Other

**8** Your Internal Billing Reference: 80-71569

**9** Required Signature: Mrs. D'Abate Date: 10/15/01

[Online shipping at fedex.com](http://online.shipping.fedex.com)

1234 5678 9010 0425

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 20	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

#### APPENDIX 4: Excepted Package “Checklist”

<b>Items</b>	<b>Please select a check the appropriate Box</b>
<b>Training</b>	
Do you have the proper training?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Authorization</b>	
Did you obtained authorization from Radiation Compliance Specialist?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Packaging</b>	
The activity does not exceed excepted package limit shown in Table 1	<input type="checkbox"/> Yes <input type="checkbox"/> No
The package must retain its radioactive content under routine conditions of transport: strong, tight packages that will not leak any of the radioactive material	<input type="checkbox"/> Yes <input type="checkbox"/> No
Wipe tests for removable contamination on the external surface of the outer package is less than or equal to 4.0 Bq/cm <sup>2</sup> :	<input type="checkbox"/> Yes <input type="checkbox"/> No
Radiation level at any point on the external surface of the outer package is less than or equal to 5 µSv/h	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Marking and Labels</b>	
Weight of the package is below 50 kg	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, have its gross weight marked on the outside of the package
The proper shipping name	<input type="checkbox"/> Yes <input type="checkbox"/> No
The correct UN number must appear on package	<input type="checkbox"/> Yes <input type="checkbox"/> No
Full name and address of the shipper and consignee	<input type="checkbox"/> Yes <input type="checkbox"/> No
A radioactive sign must be placed inside the package (outside of the inner package), and readily visible upon opening	<input type="checkbox"/> Yes <input type="checkbox"/> No
Radioactive Material, Excepted Package label is on the outer package	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other hazardous properties are present (i.e. Dry ice)	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, put the appropriate

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 21	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

---

	labels
<b>Documentations</b>	
Filling the proper shipping document	<input type="checkbox"/> Yes <input type="checkbox"/> No
A copy of the shipping documents must be giving to ORM	<input type="checkbox"/> Yes <input type="checkbox"/> No
When carbon dioxide, solid (dry ice) is used as a refrigerant, the additional marking requirements of are required and no Shipping Document or Shipper's Declaration is required	<input type="checkbox"/> Yes <input type="checkbox"/> No

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 22	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

**APPENDIX 5: Type A Package “Checklist” (Air)**

<b>Items</b>	<b>Please select a check the appropriate Box</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
<b>Training</b>			
Do you have the proper training?			
<b>Authorization</b>			
Did you obtain authorization from Radiation Compliance Specialist?			
<b>Shipper’s Dangerous Goods Declaration Form</b>			
Two Copies in English			
Full name and address of Shipper and Consignee			
The number of pages shown			
The non-applicable Aircraft Type deleted			
If full name of Airport or City of Departure or Destination is not shown, enter it.			
The word “Non-Radioactive” deleted			
<b>Identification</b>			
UN Number preceded by prefix “UN”			
Proper Shipping Name.			
Class 7			
Subsidiary Risk, in parentheses, immediately following Class			
Packing Group if required for Subsidiary Risk			
<b>Quantity and Type of Packing</b>			
Name of Radionuclide(s)			
A description of the physical and chemical form if in other form			
The number and type of packages and the activity in Becquerel or multiples thereof in each package.			
For different individual radionuclide, the activity of each radionuclide and the words “All packed in one”			
Activity within limits for Type A packages			
<b>Packing Instructions</b>			
Transport Index and dimensions for Category II and Category III only			
Identification marks shown and a copy of the document in English attached to DGD for the following:			
Special Form approval certificate (if any)			
Additional Handling Information (if any)			
Name and Title (or Department) of Signatory, Place and Date indicated			
Signature of Shipper			
<b>Air Waybill Handling Information</b>			
The statement: “Dangerous goods as per attached Shipper’s Declaration” or “Dangerous Goods as per Attached DGD”			
Cargo Aircraft Only or CAO, if any			

<b>Date Issued:</b> December 1, 2010	<b>Page No.:</b> 23	<b>Document No.:</b> 1
<b>Revision:</b>	<b>Subject: Transportation of Dangerous Good Class 7</b>	

Where non-dangerous goods are included, the number of pieces of dangerous goods shown			
<b>Markings</b>			
Type A packages			
The UN Number			
The Proper Shipping Name			
The full Name and Address of the Shipper and Consignee			
The permissible gross weight if it exceeds 50 kg			
<b>Labeling</b>			
Two correctly completed Radioactive Hazard labels on opposite sides			
Applicable label(s) identifying the Subsidiary risk next to the Radioactive Hazard labels			
Two Cargo Aircraft Only labels, if required			
All labels correctly affixed and irrelevant marks and labels removed			
Do you require any Placards?			
<b>Over packs</b>			
Packaging markings as required must be clearly visible or reproduced on the outside of the over pack			
The word "Over pack" marked if all markings are not visible			
Hazard labels reflect total for over pack			
<b>ERAP</b>			
Do you require an ERAP?			

**Link:** [http://www.uottawa.ca/services/ehss/documents/EN\\_Form\\_Rad.pdf](http://www.uottawa.ca/services/ehss/documents/EN_Form_Rad.pdf)