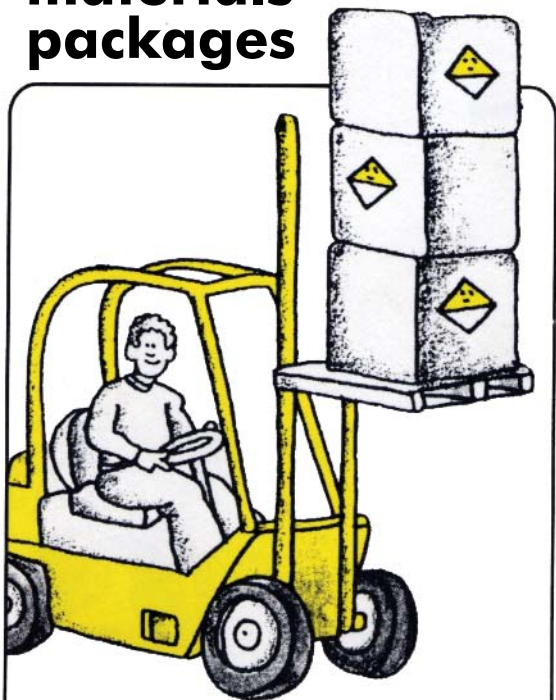


# How to handle Radioactive materials packages



**A guide for  
cargo handlers**

U.S. Department of Transportation  
Revised September 2006

Copies of this guide may be obtained from

U.S. Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
Office of Hazardous Materials Initiatives  
and Training  
400 Seventh Street, S.W., PHH-50  
Washington, D.C. 20590

[http:// hazmat.dot.gov](http://hazmat.dot.gov) - click on "Training Information"

PHH50-0089-0107

# How to handle Radioactive materials packages

---

## A guide for cargo handlers



U.S. Department  
of Transportation

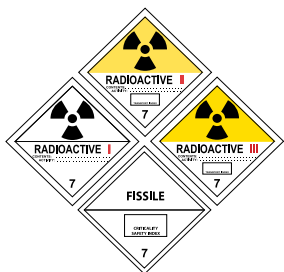
**Pipeline and  
Hazardous Materials  
Safety Administration**

Revised September 2006

## Radioactive Materials Packages



You can recognize many radioactive materials packages by their labels.



A RADIOACTIVE WHITE-I label means practically no radiation outside the package, while a RADIOACTIVE YELLOW-II label means some radiation outside the package. The RADIOACTIVE YELLOW-III label is for higher radiation levels than RADIOACTIVE I and II. The FISSILE white label indicates special handling instructions found on page 9. Packages with limited quantities of radioactive materials do not have these labels.

### **Radioactive Material, Excepted Package**

This package contains radioactive material and is in all respects in compliance with the applicable international and national governmental regulations

UN \_\_\_\_\_

The information for this package need not appear on the Notification to Captain (NOTOC)

Limited quantities of radioactive materials can be identified by the markings: UN2908, UN2909, UN2910, or UN2911. If these packages are to be shipped by air, they will have a "Radioactive materials, Excepted Package" label.



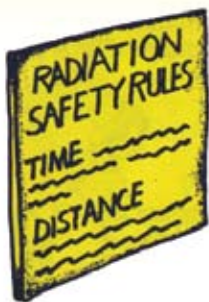
Most radioactive materials packages contain radioactive drugs that are being transported to hospitals.



The radioactive drugs are given to patients for the detection and treatment of disease. Radioactive materials are also used by industry and by research laboratories.



Packages of radioactive materials are safe to handle under normal conditions. Studies show that cargo handlers get very little radiation exposure from handling them.



However, you should always follow good work habits that will prevent unnecessary exposure to any hazardous sources, including radiation.

The radiation dose you receive depends on how long you stay near a radioactive materials package. It also depends on how close you are to the package, because the radiation level drops off rapidly as you get farther away from the package.

Therefore, the basic rules to follow to prevent unnecessary radiation exposures are called the TIME and DISTANCE rules. They are given on the next four pages.

---

## Time Rule

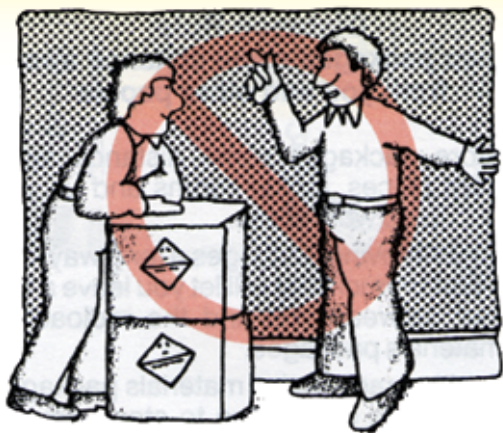
### Keep contact time with package short

- Do not take rest periods near radioactive materials packages.
- Do not use packages as meeting places.
- Do not do time-consuming tasks, such as paperwork, near packages.
- Handle packages without delay when moving them from one place to another.



Do not hang around packages.





Do not socialize near packages.



Do not use packages as a desk.

---

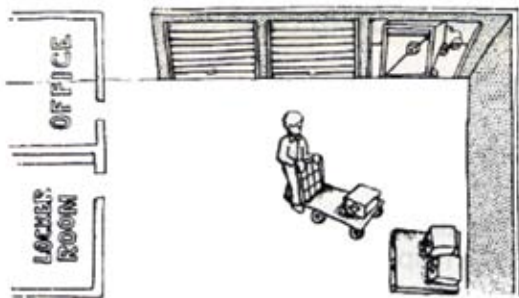
## Distance Rule

### Keep packages some distance away from you and other people

- When moving packages a long way, use a cart or truck that will let you leave a few feet between you and the radioactive materials packages.
- Position radioactive materials packages so people don't have to stand next to them while handling other packages.
- When there is a convenient choice of locations, store packages farthest from areas occupied by people.
- Do not store packages with transport indexes (TIs) or criticality safety indexes (CSIs) that add up to more than 50 in any group. Groups of such packages must be stored 6m (20 ft) from all other groups of such packages.



Use a cart to keep packages some distance away from you when moving them a long way.



Stow packages away from areas occupied by people.



Don't place packages in the cab with the driver.

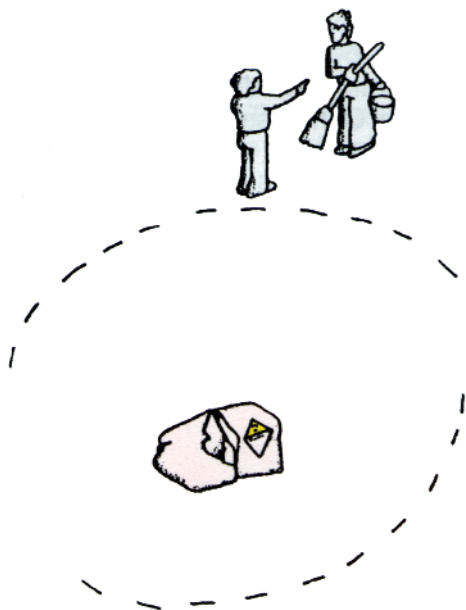


In case of accidents, you can receive higher exposures if you do not handle the situation properly. The steps you should follow if there is an accident are given on page 12.

---

## **What To Do In Case of an Accident Where a package containing radioactive material may have been damaged**

1. Stay away from the package and do not touch it.
2. Keep other people away from the package.
3. Notify your supervisor. He or she will call for help.
4. Tell anybody who may have touched the package to go to a control point to be checked by radiation protection specialists.
5. Wash your hands thoroughly if you touched the package or objects near it.
6. Have yourself checked by a radiation protection specialist before you leave work.



**Do not** clean up the area where the accident occurred. This must be done under the direction of specialists.

---

## **Questions and Answers**

The rest of this booklet contains answers to some common questions asked by cargo handlers.

---

**Q Is it safe to handle packages of radioactive materials?**

A Packages of radioactive materials are safe to handle under normal conditions. The radiation exposure received from handling these packages is not likely to cause any adverse health effects.

However, you should still try to avoid unnecessary radiation exposure by following the Time-Distance rules described earlier in this booklet.

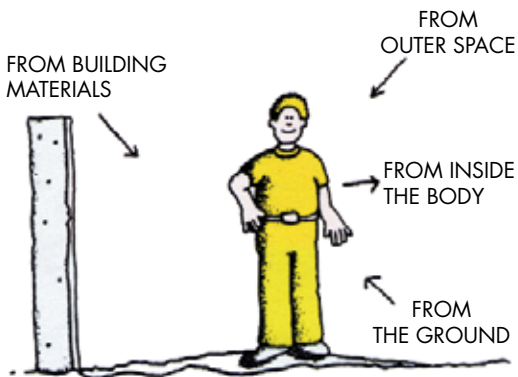
In case of an accident, it may or may not be safe to handle radioactive materials packages. Be sure to stay away from a package that has been badly damaged or is leaking.



## Q Is it true that everybody is exposed to radiation?

A Yes, everybody in the world receives a small amount of radiation exposure at all times. Radiation is given off constantly by radioactive materials all around us—in the ground, in the walls of buildings, even in our own bodies. In addition, the earth is bombarded by radiation from the sun and from outer space, known as cosmic radiation.

The additional radiation doses cargo handlers receive in a year from handling radioactive materials packages are generally less than the doses received from these natural sources.



Radiation exposure from the environment.

---

**Q Can a person or food become radioactive from being near packages of radioactive material?**

A You cannot become radioactive from the radiation given off from packages of radioactive materials. The exposure to radiation stops when you move away from the packages.

The same thing is true for food. If lobsters are stacked next to a radioactive materials package, they will not become radioactive and it is not dangerous to eat them.

The only way you can get any radioactivity on you is if the packaging fails and the radioactive material leaks out and comes in contact with you. If you think this has happened, contact your supervisor. The supervisor will arrange to check you with a radiation meter and will see that any radioactive material found is cleaned up properly (usually with soap and water).

---

**Q How serious is leakage of radioactive liquid or powder from a package if there is an accident?**

A There is a chance that radioactive materials that leak from a broken package can be breathed in or swallowed. Even if some gets into your body, however, it is not necessarily dangerous. Remember that most of the packages shipped contain radioactive drugs that are deliberately given to patients by doctors. Some radioactive materials are more dangerous than others. However, the more dangerous radioactive materials are shipped infrequently and must be contained in especially strong packages. It is unlikely that the contents will leak out, even if the packages are dropped or damaged.

---

# Glossary

**Activity** is a measure of the quantity of radioactivity emitted by a radioisotope and is used to determine the amount of radioactive material which may be transported in various types of packagings.

**Content** (indicated on the radioactive labels) is the identification of the radioactive material inside the package.

**Criticality Safety Index (CSI)** is a number which is used to provide control over the accumulation of packages, overpacks, or freight containers that contain FISSILE material.

**Radioactive materials** spontaneously and continuously emit ionizing radiation, that can be harmful to the health of humans and animals and can affect photographic or X-Ray film. This radiation cannot be detected by any of the human senses (sight, smell, hearing, touch, or taste), but it can be detected and measured with suitable instruments.

**Transport Index (TI)** is a single number assigned to a package, overpack, or freight container to provide control over radiation exposure and used to designate the spacing requirements to be exercised by the handler/carrier during transportation and storage.

## TO LEARN MORE...

For information about hazmat publications  
and other training materials:

### **Visit our website:**

<http://hazmat.dot.gov>

### **Write:**

Office of Hazardous Materials  
Initiatives and Training  
400 Seventh Street, SW,  
PHH50, RM 7424  
Washington, DC 20590-0001

Fax: (202) 366-7342

Email: [training@dot.gov](mailto:training@dot.gov)

Or Phone: (202) 366-2301



For information about  
Hazmat Regulations  
Contact our Hazmat INFO-LINE

**E-mail:** [infocntr@dot.gov](mailto:infocntr@dot.gov)