

Radiation Safety for Mobile Truck Drivers

Worker Instruction Program

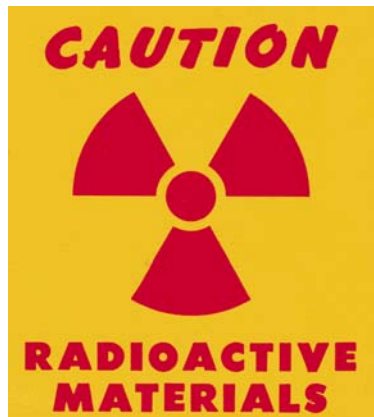
Facility: _____

Date Completed: _____

Because you drive the mobile Nuclear Medicine / PET truck, you are considered a radiation worker and a HAZMAT employee. The nuclear medicine area of the truck is considered a restricted area. Therefore, we are required to instruct you with regard to the proper procedures to follow while in this area.

Radiation Warning Signs to Recognize

All radiation warning signs consist of a magenta-colored three-blade symbol on a yellow background. The label on the sign will give you further information about the amount of radiation in the area.



Caution Radioactive Materials: – This sign warns that you are about to enter a room where radioactive materials are used or stored. The radioactive materials will be stored in containers that prevent the material from escaping unless someone is working with the materials at the time you enter. These containers are also labeled with a **Caution Radioactive Materials** sign. Never touch or move these containers.

Caution Radiation Area: – This sign warns that the area where the sign is posted has higher radiation levels than the remainder of the room. These areas occur only in rooms that are labeled with a **Caution Radioactive Materials** sign. There will be no area on the mobile truck that will require the posting of this sign.

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What Materials on the Truck are Radioactive?

The Nuclear Medicine / PET Department use radiopharmaceuticals for diagnosis and treatment of patients. Radiopharmaceuticals are pharmaceuticals that are radioactive. All liquid radioactive materials are kept in special containers to prevent the material from escaping.

There are also several radioactive sources called sealed sources that are used for calibration of the equipment. These sources have the radioactive material sealed in plastic and do not present a contamination hazard to anyone handling the sources. The sources are routinely tested to ensure that they are still sealed and not leaking radioactive material.

It is required that all containers containing radioactive materials be labeled with a yellow and purple symbol like the one above.

Is It Safe For You to Enter the Imaging Area?

Yes, all radioactive materials are properly shielded to avoid exposing individuals working in the area.

1. Note the radiation warning signs. Do not handle radioactive materials labeled with a *Caution Radioactive Materials* sign unless told to do so.
2. Open the door carefully, in order to avoid collisions.
3. If you notice that the radioactive materials cabinet has opened during transport, contact the Nuclear Medicine Technologist immediately. Do not attempt to move the sources yourself.

What To Do if Something Spills

If you notice a container labeled with the radiation symbol that has been knocked over and appears to have spilled its contents, you must take the following steps:

1. Do not attempt to touch the container or its contents.
2. If liquid is leaking from the container, you should drop an absorbent pad or paper toweling over the liquid. Do not wipe up the liquid.
3. If you think you may have stepped into radioactive material, take your shoes off and leave them at the site of the spill.
4. If you think you may have touched radioactive material or liquid, wash your hands thoroughly. Then put gloves on.
5. Block off the area to prevent spread by other people.
6. Call the Radiation Safety Officer and the Nuclear Medicine Technologist immediately. They will give you further instructions.

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ADDITIONAL INFORMATION FOR DRIVERS

1. The imaging area of the truck must be locked at all times when unattended by a technologist.
2. All containers that are labeled with a Caution Radioactive Materials sign must be secured at all times. Following a drive to or from a site of use, you should enter the imaging area to verify that all sources are in their secured area. If you enter the truck and discover a source that is not secure, you must contact the nuclear medicine technologist. If the nuclear medicine technologist is not available, contact the RSO. If the source appears to be crushed or leaking, follow the spill procedures listed above.
3. As the driver of the truck it is not likely you will be exposed to measurable levels of radiation. Therefore, you will not be required to wear an exposure monitor. If you have any questions regarding your radiation exposure, contact the Radiation Safety Officer.

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D.O.T. – RADIOACTIVE MATERIAL SHIPMENT Compliance with 49 CFR 170 – 189 and 10 CFR 71

The transfer and/or shipment of packages that contain radioactive material are considered hazardous material shipments and are governed by the following federal regulations:

49 CFR Parts 170 – 189 Department of Transportation (DOT)

10 CFR Part 30.34[c] and Part 30.41 Nuclear Regulatory Commission (NRC)

10 CFR Part 71 Nuclear Regulatory Commission (NRC)

The DOT regulations deal with Interstate Commerce only. However, the NRC, via Part 71.5[c] requires that “the licensee shall conform to the standards and requirements of the DOT... as if the shipment or transportation were in interstate”. Therefore, NRC regulations govern not only interstate commerce, but any radioactive package shipment. Specifically, DOT regulations apply to any licensee who prepares and transports packages as private carriers or prepares and delivers radioactive material packages to common or contract carriers.

All employees involved with the packaging, marking, labeling, measuring, loading, transporting and storage of packages containing radioactive material are classified as “HAZMAT Employees” and must be aware of the following:

Limited Quantity Vs. Normal Form Shipments

The difference between these two types of radioactive shipments is purely based on activity. The Limited Quantity limits are noted below. Any activity above these limits is considered a Normal Form Shipment.

If combinations of radionuclides are shipped together in the same package, the total activity for the package must not exceed the lowest activity limit noted below for the radionuclides to be shipped.

Radionuclide	Max Activity – mCi
F-18	1.6
Co-57	9
Ga-67	10
Sr-89	1
Mo-99	2
Tc-99m	10
In-111	2.5
I-123	5
I-131	1
Xe-133	1000
Tl-201	20

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Packages/Containers

A Security Seal is required for all Normal Form packages. This seal must be able to show if the package integrity has been breached. Therefore, padlocks are not acceptable.

Normal Form packages or containers must pass a series of physical abuse tests, i.e., vibration test, corner drop test, drop test, water spray test, penetration test and compression test. Once a container has passed these various tests it is classified as a “Type A” container and is therefore suitable for Normal Form Shipments. Certification of Type A testing must be on file.

Limited Quantity packages must only be strong and in good condition. The smallest dimension of any package must be at least four (4) inches to accommodate the following labels.

Labels, Signs and Measurements

Normal Form packages must contain the exterior labeling “Radioactive Material N.O.S. UN2982” and Limited Quantity packages must be labeled “UN2910” as international accepted content designations. Package interior must contain a Radioactive Materials sign. This can be on a syringe or lead container.

The contents and activity are to be noted on the diamond shaped DOT labels, designated as White I, Yellow II and Yellow III. These labels must be placed on opposite sides of the package. The technologist will properly label the package as required.

Any vehicle used to carry Yellow III packages must be placarded with a specific diamond sign noting RADIOACTIVE in two (2) inch high letters. The sign must be yellow, black and white. We will not be transporting any Yellow III packages on the mobile nuclear medicine truck.

The diamond label used is determined by the exposure measurements obtained with a GM survey meter. The labels are noted below:

	<u>Surface</u>	<u>One Meter</u>
<u>WHITE I</u>	<0.5 mR/hr	Background
<u>YELLOW II</u>	0.5 - 50 mR/hr	<1 mR/hr
<u>YELLOW III</u>	50 - 200 mR/hr	1 - 10 mR/hr
<u>YELLOW III</u> Exclusive Use Only	200 - 1000 mR/hr	>10 mR/hr



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The Yellow II and Yellow III both require the notation of a "Transport Index" (TI) which is the rounded-up one meter exposure reading. The technologist will make these measurements.

All packages containing radioactive material, except exclusive gaseous and "Special Form" shipments must be wipe tested on the exterior of the package for contamination. The limit is **22 dpm/cm²** over 300 cm² or 6600 dpm. This is done by the technologist.

If any of the limits noted above are exceeded upon receipt, the technologist will immediately notify the RSO, the final delivery carrier and by telephone and fax the regional office of the NRC.

Shipping Papers

Packages containing radioactive material will require a "Bill of Lading" and "Shippers Certificate". The Bill of Lading notes the contents, activity and form of the material shipped. The certificate is a signed portion of the document attesting to compliance with DOT requirements. A sample is attached for your reference.

These documents are important in case of accident, loss or theft. These documents must be kept within immediate reach of the driver, restrained by a lap belt.

Emergency Information

Title 49 CFR Part 172.602 requires the existence of emergency response information. This information must note the following and a sample is attached for your reference.

These documents are important in case of accident, loss or theft. These documents must be kept within immediate reach of the driver, restrained by a lap belt and not with the package.

- Description and technical name of the hazardous material
- Immediate health hazards
- Risk of fire and explosion
- Immediate precautions
- Immediate method of handling fire
- Handling spills
- First aid

Please familiarize yourself with these documents. If you are in an accident or are stopped by the police, you may be asked to show this documentation.