



DEPARTMENT OF THE NAVY
NAVY ENVIRONMENTAL HEALTH CENTER
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6470
Ser OM/09488
30 APR 1997

From: Commanding Officer, Navy Environmental Health Center
Subj: NAVY RADIOACTIVE MATERIAL PERMIT (NRMP) TRANSPORTATION
AND TRAINING REQUIREMENTS

Encl: (1) 49 CFR Parts 171-173, Selected DOT Regulations
(2) Areas of RAM Transportation Safety
(3) List of Applicable 49 CFR Regulations
(4) RAM Transportation Examinations for RSOs

1. Enclosure (1) contains applicable paragraphs of the Department of Transportation regulations on the shipment of hazardous materials to include radioactive material (RAM).

a. Part 171 includes definitions, units and incident reporting procedures.

b. Part 172 describes shipping papers, marking, labeling, and training requirements.

c. Part 173 Subpart H covers specific shipping requirements for radioactive materials.

2. Each Radiation Safety Officer (RSO) will ensure that all personnel who handle/package/ receive/document shipments of RAM are properly trained under this part and that RAM is not handled by personnel who are not properly trained. This training should ensure that each employee is familiar with the general provisions of the regulations, has knowledge of specific requirements of the regulations as they apply to his/her job functions, knows actions to take in the event of an emergency as well as self-protection and accident prevention methods. The RSO will conduct training and testing for all personnel and repeat the training and testing every three years. Records of individual training must be maintained in an auditable form for three years. See 49 CFR Part 172.700-704.

3. Enclosure (2) lists areas of RAM transportation safety which may apply to your radiation safety program. Items 1, 2 and 3 probably apply to all facilities, but items 4, 5 and 6 apply only to facilities with nuclear medicine and/or brachytherapy services. If your command chooses to decay sources in storage under 10 CFR 35.92 rather than returning them, the RAM shipping regulations (items 4, 5 and 6) are not applicable.

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4. Enclosure (3) lists specific paragraphs applicable to shipping of RAM. Read all the regulations which apply to your program, complete the respective RSO examinations of enclosure (4) and return to NEHC by 1 June 1997. These examinations will be returned to you as documentation of RSO initial training. Also submit your training plan listing areas of enclosure (2) to be covered and certify that all individual training and testing has been completed no later than 1 June 1997. Fax transmission is acceptable.

5. For further information, you may contact LCDR S. J. Wolff, MSC, USN at DSN 864-5575 or (757) 363-5575, fax at DSN 565-9481 or (757) 445-9481 or by e-mail at wolffs@ehc50.med.navy.mil.


R. L. BUCK

Distribution:
All medical NRMP holders

Copy to:
CNO(N455)
BUMED (MED-211)
NSHS Bethesda, MD (Attn: Clinical Nuclear Medicine School)
NAVUSEAMEDINSTITUTE Groton, CT

AREAS OF RAM TRANSPORTATION SAFETY

1. RECEIPT OF PACKAGES (ALL PERMITTEES)
 - a. Reference 10 CFR 20.1906
 - b. NRC Regulatory Guide 10.8, Appendices K and L
 - c. Note: This may apply to supply personnel if they receive and/or handle RAM packages
2. GENERAL SAFETY AND AWARENESS (ALL PERMITTEES)
 - a. Reference 10 CFR Part 20
 - b. Reference 49 CFR Parts 171 and 172
3. TRANSPORTATION OF RADIACS (ALL PERMITTEES)
 - a. Reference SE700-AA-MAN-100/RADIAC, RADIAC Policy and Procedures Manual Volume I, dated 1Sep96, Section 6
 - b. Note: Applies to shipment as well as vehicular transportation of RADIACS for calibration.
4. RETURN OF USED GENERATORS (HOSPITALS)
 - a. Reference 49 CFR Parts 172 and 173 (See enclosure (3))
 - b. Note: In some cases manufacturers or distributors may provide instructions for preparing packages, but it remains the responsibility of the RSO to verify that these procedures are in compliance with applicable DOT regulations.
5. RETURN OF RADIOPHARMACEUTICAL DOSES (HOSPITALS)
 - a. Reference 49 CFR Parts 172 and 173 (See enclosure (3))
 - b. Note: In all cases except contracted shipments, the local facility retains "shipper" status and is legally responsible for the proper preparation of RAM packages for shipment. It is highly recommended that each hospital obtain a written agreement stating that their contract radiopharmacy will assume shipper responsibility for all returns of used or unused doses.
6. BRACHYTHERAPY SOURCE RETURN (NAVAL MEDICAL CENTERS)
 - a. Reference 49 CFR Parts 172 and 173 (See enclosure (3))
 - b. Note: In some cases manufacturers or distributors may provide instructions for preparing packages, but it remains the responsibility of the RSO to verify that these procedures are in compliance with applicable DOT regulations.

LIST OF APPLICABLE TITLE 49 DOT REGULATIONS
(OTHER PARAGRAPHS MAY APPLY)

EXCEPTED PACKAGES FOR LIMITED QUANTITIES OF RADIOACTIVE MATERIAL

172.203 Shipping paper entries
172.204 Shipper's certification

173.403 Definitions
173.410 General design requirements
173.421 Excepted packages for limited quantities
173.422 Additional design requirements
173.425 Activity limits
173.435 A1 and A2 limits
173.441 Radiation level limits
173.443 Contamination limits
173.448 Passenger/cargo aircraft

TYPE A PACKAGES OF RADIOACTIVE MATERIAL

172.203 Shipping paper entries
172.204 Shipper's certification
172.310 Marking
172.312 Liquids
172.403 Labeling
172.602 Emergency response information
172.604 Emergency response telephone number

173.403 Definitions
173.410 General design requirements
173.412 Type A packages
173.415 Authorized type A packages
173.431 Activity limits
173.435 A1 and A2 limits
173.441 Radiation level limits
173.443 Contamination limits
173.448 Passenger/cargo aircraft

EXAMINATION FOR RECEIPT OF RADIOACTIVE MATERIALS

1. The external surfaces of the following packages must be monitored for radioactive contamination:
(circle all that apply)
 - a. Labeled Radioactive White I
 - b. Containing gaseous forms only
 - c. Marked Limited quantity - excepted package
 - d. Containing sealed sources
 - e. Damaged package

2. The external surfaces of the following packages must be monitored for radiation levels:
(circle all that apply)
 - a. Labeled Radioactive White I
 - b. Damaged package
 - c. Marked Limited quantity - excepted package
 - d. Containing sealed sources less than type A quantity

3. True or False:

Required monitoring must always be performed within three hours of receipt of the package.

4. The carrier and NEHC must be notified immediately of:
 - a. Any damaged package
 - b. Contamination exceeding limits
 - c. Radiation levels exceeding limits
 - d. Packages labeled improperly

5. The radiation level on the surface of a package received should never exceed _____.

6. The removable contamination level on the surface of a package received should never exceed _____.

7. RAM receipt may occur: (Mark all that apply)
 - a. In the nuclear medicine clinic
 - b. In the warehouse
 - c. At the security desk
 - d. In the radiology department

EXAMINATION FOR GENERAL RADIATION SAFETY

1. The annual occupational dose limit for adults is:
 - a. 0.5 rem (.005 Sv)
 - b. 5.0 rem (.05 Sv)
 - c. 50 rem (0.5 Sv)

2. The total effective dose equivalent is the sum of _____ and _____.

3. Define the following terms:
 - a. 1 gray = _____ rad
 - b. 1 rem = _____ sievert

4. True or False:

The dose to an embryo/fetus due to occupational exposure of any pregnant worker may not exceed 0.5 rem (5 mSv).

5. Individual radiation monitoring devices shall be worn by: (Choose the best answer)
 - a. Adults likely to receive 0.5 rem (5 mSv) per year
 - b. Individuals working with unsealed sources
 - c. Adults likely to receive 5 rem (50 mSv) per year
 - d. Individuals working with sealed sources

6. The total effective dose equivalent to individual members of the general public shall not exceed _____ per year.

7. When the regulations require reports to the Nuclear Regulatory Commission, Navy Radioactive Material Permit holders will report to _____.

8. Which of the following may be hazmat employees:
 - a. Receiving clerk
 - b. Nuclear medicine technician
 - c. Shipping clerk
 - d. Radiation Safety Officer
 - e. All of the above
 - f. None of the above

9. In the hazardous materials table, radioactive materials are listed as hazard class _____.

10. Shipping documents must contain the activity of radionuclide in units of _____.

EXAMINATION FOR RADIAC SHIPPING

1. When is a shipping document required for a RADIAC?
 - a. When it contains a source
 - b. Always, whether it contains a source or not
2. Which form is used as a shipping document?
3. According to the RADIAC manual, how is a RADIAC containing a sealed check source classified? (Pick one)
 - a. Excepted package - limited quantity
 - b. Excepted package - instruments or articles
 - c. Type A package
 - d. Type B package
4. The shipping document must contain the source strength in units of (Pick one):
 - a. Ci
 - b. Tbg
 - c. mCi
 - d. Bq
5. True or False: RADIACs containing sealed sources may be shipped on passenger aircraft.
6. List 3 of the 4 items that must be included in the description of each item listed on the shipping document:
7. When is the outside packaging labelled "RADIOACTIVE"?
8. When is the outside of the inner packaging labelled "RADIOACTIVE"?
9. According to the RADIAC manual, the statement "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910." must be on:
 - a. The shipping document
 - b. The exterior of the package
 - c. Both
 - d. Neither
10. According to 49 CFR 173.410, RADIACs would be shipped in what type of container?
 - a. One that will withstand normal transport conditions
 - b. Type A
 - c. Type B
11. True or False: Transporting a RADIAC containing a check source over public roads requires a shipping document.

EXAMINATION FOR RETURN SHIPMENTS OF RAM

1. Who is legally responsible for the proper package preparation for return shipments?
 - a. The shipper
 - b. The receiver
 - c. The licensee
 - d. The vendor
2. True or False: Packages with external surface radiation levels greater than 0.5 mR/hr may be shipped as limited quantity - excepted packages of radioactive material.
3. In terms of A1 or A2 quantities, the amount of RAM allowed in a limited quantity - excepted package of radioactive material is _____.
4. "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material - excepted package ..." wording must be included:
 - a. In the package
 - b. On the package
 - c. With the packing list
 - d. On the shipping document
 - e. Any of the above
 - f. None of the above
5. Quantity of radioactivity must be expressed in units of _____.
6. What label category is required for a Type A package with a Transport Index less than 1 ?
7. True or False : An excepted package - limited quantity of radioactive material shall not bear the term "radioactive" anywhere.
8. What is the only type of radioactive material that may be carried on a passenger aircraft ?
9. Provide an example of normal form radioactive material:
_____.
10. Provide an example of special form radioactive material:
_____.