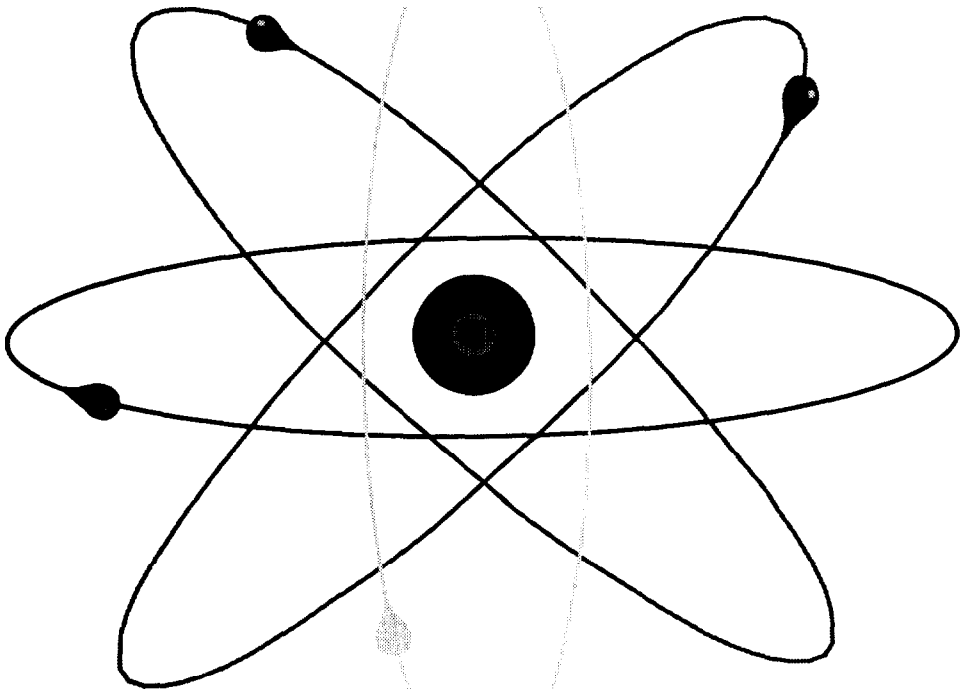
TB 43-0137

TECHNICAL BULLETIN
TRANSPORTATION INFORMATION
FOR
CECOM RADIOACTIVE COMMODITIES



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HEADQUARTERS DEPARTMENT OF THE ARMY
1 September 1998

Technical Bulletin

No. 43-0137

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 September 1998

TRANSPORTATION INFORMATION FOR CECOM RADIOACTIVE COMMODITIES

*** This manual supersedes TB 43-0137, dated 1 May 1994**

TRANSPORTATION INFORMATION FOR CECOM RADIOACTIVE COMMODITIES

SECTION I

INTRODUCTION

1. Purpose and Scope. This technical bulletin (TB) provides a basic reference for personnel transporting U.S. Army Communications - Electronics Command (CECOM) managed radioactive commodities. It summarizes the basic regulatory packaging and shipping requirements for commonly shipped CECOM radioactive commodities to ensure that their transport complies with applicable DA and Federal regulations. The information contained herein complies with Title 49, Code of Federal Regulations (49 CFR), IO CFR Part 71, Army Regulation (AR) 385-11 and AR 700-64 for the shipment of CECOM managed radioactive commodities within CONUS. This TB is not applicable for mixtures of radioisotopes or for radioactive waste shipments (consult 49 CFR, IO CFR 61 and AR 385-11).

2. General.

a. The information contained in this TB and special instructions contained in the equipment technical manual (TM) will be followed to ensure safe transport of the radioactive item and the safety of personnel involved in the handling process. All personnel engaged in the transportation of CECOM radioactive commodities will be aware of the information contained in this TB. All appendices list the commodity activity in Becquerels (Bq).

b. Appendix A Appendix A lists publications concerning control, transportation, and marking of radioactive material.

c. Appendix B Appendix B lists CECOM radioactive item National Stock Numbers (NSN) cross referenced to a Type Number.

d. Appendix C Appendix C lists CECOM radium commodity NSNs cross referenced to a Type Number.

e. Appendix D Appendix D lists CECOM thorium commodity NSNs cross referenced to a Type Number.

f. Appendix E Appendix E is a list of abbreviations and definitions.

g. Appendix F Appendix F contains information which can be used in the transport of CECOM radioactive commodities. Included is a table of commonly used radioactive commodity isotopes, their physical properties, and a table of Type A package limits. Also, included in this appendix is a sample radioactive material movement form which may be utilized for all radioactive material movements and a sample wipe test analysis request form for submitting wipe test samples for laboratory analysis.

h. Appendix G Appendix G contains a table of conversion factors to convert between units of activity.

3. Proponent Agency. CECOM is the proponent agency for this TB. Users are encouraged to submit recommended changes, suggested improvements, additions, reports of omissions and errors. Comments should be forwarded directly to Commander, U.S. Army CECOM and Fort Monmouth, ATTN: AMSEL-SF-RE, Fort Monmouth, New Jersey 07703-5024. Submit comments on DA Form 2028 (Recommended Changes to Publications and Blank Form) keyed to the specific page, paragraph, and line of text in which the change is recommended. A brief reason for each proposed change or comment should be furnished to ensure understanding and complete evaluation.

4. Logistics and Safety Support.

a. CECOM is the National Inventory Control Point (NICP) and Radiation Protection Officer (RPO) for the radioactive commodities listed in this TB. You may contact the NICP for logistical support and the RPO for radiation safety guidance at the addresses listed below.

b. Your local installation transportation office should have a copy of 49 CFR. You may order a copy from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. If you currently have Title 49 and wish to be placed on the mailing list for updated changes, write to: U.S. Department of Transportation, Materials Transport Bureau Information Services Division DMT- 11, Washington, DC 20590.

CECOM NICP - U.S. Army Communications-Electronics Command
ATTN: AMSEL-LC-LEO-D
Fort Monmouth, NJ 07703-5000
DSN: 992-9362, Commercial: (732) 532-9362

CECOM RPO - U.S. Army Communications-Electronics Command
ATTN: AMSEL-SF-RE
Fort Monmouth. NJ 07703-5024
DSN: 987-3112, Commercial: (732) 427-3112

SECTION II

CECOM

RADIOACTIVE COMMODITY

TRANSPORTATION INFORMATION

(TYPE NUMBER SEQUENCE)

AN/PDR-27(*) RADIAC SET with the MX-7338 Test Sample
NSN: 6665-00-832-6159

Isotope and Activity: Kr-85, 1.85E08 Bq (5.0E03 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7. UN2910.

Chemical and Physical Form: Normal form (gas).

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

-The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- An AN/PDR-27(*) RADIAC Set shipped without the MX-7338 Radioactive Test Sample is a NONRADIOACTIVE shipment.

- There is a maximum limit of 54 AN/PDR-27s(*) with their MX-7338 Radioactive Test Samples that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level on the external surface of the package to less than 0.005 mSv/hr (0.5 mrem/hr).

- You may mail (USPS) up to 5 AN/PDR-27s(*) with their MX-7338 Radioactive Test Samples per package. All other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

(*) Model numbers (A, G, J, L, P, Q, R, S)

AN/PDR-56F RADIAC SET
NSN: 6665-00-211-8695 or 6665-01-113-9530

Isotope and Activity: Th-232, 8.70E03 Bq (2.35E-01 μCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Metal foil, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mremhr).

Contamination Wipe Survey: Required prior to shipment.

- The non-tixed radioactive contamination on the external surfaces of the package shall not exceed 22 dprn/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- The Check Source is permanently attached to the AN/PDR-56F RADIAC Set.

- There is no limit to the number of AN/PDR-56F RADIAC Sets that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level to less than 0.005 mSv/hr (0.5 mrem/hr).

- You may mail (USPS) as many AN/PDR-56F RADIAC Sets as necessary; all other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

AN/PDR-60 RADIAC SET with the CS-1 CHECK SOURCE
NSN: 6665-00-903-7732

Isotope and Activity: Pu-239,3.70E02 Bq (0.01 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Plutonium oxide electroplated on metal, normal form.

Package Requirements:

Packaging: Excepted Packaging

Package Label: Exempt

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 2.2 dpmcm' (alpha).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- An AN/PDR-60 RADIAC Set shipped without the CS-1 Check Source is a NONRADIOACTIVE shipment.

- There is a maximum limit of 541 AN/PDR-60 RADIAC Sets with their CS-1 Check Sources that you may ship per package.

- You may mail (USPS) up to 54 AN/PDR-60 RADIAC Sets. All other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

AN/PDR-60 RADIAC SET with the CS-12 CHECK SOURCE
NSN: 6665-00-802-9126

Isotope and Activity: Th-232,3.70E02 Bq (0.01 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Thorium oxide electroplated on metal, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- An AN/PDR-60 RADIAC Set shipped without the CS-12 Check Source is a NONRADIOACTIVE SHIPMENT.

- There is no limit to the number of AN/PDR-60 RADIAC Sets with their CS-12 Check Sources that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level on the external surface of the package to less than 0.005 mSv/hr (0.5 mrem/hr).

- You may mail (USPS) as many AN/PDR-60 RADIAC Sets as necessary. All other

49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

AN/PDR-77 RADIAC Set
NSN: 6665-01-347-6100

Isotope and Activity: Th-232, 1.11E03 Bq (30 nCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Metal foil, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Not required.

Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Level Survey: Not required because the radiation source activity will not produce a radiation level at any point on the external surface of the package in excess of 0.005 mSv/kr (0.5 mrem/hr), per memorandum, U.S. DOT, 23DEC1996.

Nonfixed Contamination Survey: Not required if new packaging material is used or previously used packaging material known to be free of contamination is used, per memorandum, U.S. DOT, 23DEC1996.

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

-There is no limit to the number of AN/PDR-77 RADIAC Sets that you may ship per package.

-You may mail (USPS) as many AN/PDR-77 RADIAC Sets as necessary. All other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

AN/UDM-1 RADIAC CALIBRATOR SET
NSN: 6665-00-669-0077

******IMPORTANT NOTE******

The shipment of the AN/UDM-1 RADIAC Calibrator Set may require the use of a Type B shipping container. Before you initiate a shipment request, you will contact the CECOM Directorate of Safety Risk Management for shipper requirements concerning the Quality Assurance (QA) program for use of this Type B shipping container.

******IMPORTANT NOTE******

Isotope and Maximum Activity: Co-60, 3.70E-01 TBq (10 Ci).

Basic Description: Radioactive material, Special Form, n.o.s., 7, UN2974.

Chemical and Physical Form: Cobalt-60 metal, special form, solid.

Package Requirements:

Packaging: If the corrected (decayed) activity is greater than 2.59E-01 TBq, use Type B; if the corrected activity is less than 2.59E-01 TBq use Type A DOT-7A. You will coordinate the packaging of the AN/JDM-1 for shipment with the CECOM Directorate of Safety Risk Management to ensure compliance with NRC license/QA program requirements for Type B shipping containers.

Package Label: Either two Radioactive Yellow II or Radioactive two Yellow III labels affixed to opposite sides of the package and a Cargo Aircraft Only label. Do not affix labels to the top or bottom of the package. Complete the required information on the Radioactive Yellow II or Radioactive Yellow III label used.

Package Marking:

- If Type A, mark the package “Type A DOT-7A, Radioactive Material, Special Form, n.o.s. UN2974” (markings shall be at least ½” in height).

- If Type B, mark the package “Type B, Radioactive Material, Special Form, n.o.s., UN2974” (markings shall be at least ½ in height).

- For all shipments, the gross weight shall be marked on the package. Your unit’s name and address shall be marked on the package. Exports shall be marked “USA”.

- For shipment by water, after “n.o.s.“, add “Cobalt-60”.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- For Radioactive Yellow II Labels: The surface radiation level should be greater than 0.005 mSv/hr (0.5 mrem/hr) and shall be less than or equal to 0.5 mSv/hr (50 mretir). The Transport Index (T-I.) should be greater than background and shall be less than or equal to 1.0.

- For Radioactive Yellow III Labels: The surface radiation level should be greater than 0.5 mSv/hr (50 mrem/hr), but shall not exceed 2 mSv/hr (200 mrem/hr). The T.I. should be greater than 1.0 and shall be less than or equal to 10.

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment **is not** permitted aboard passenger-carrying aircraft.

Vehicle Placarding: If Radioactive Yellow III labeling is required, you shall placard all 4 sides of the vehicle with RADIOACTIVE placards. If Radioactive Yellow II labeling is required, you are not required to placard the vehicle.

Shipping Paper Documentation: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the 'packing list or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This is to certify that the herein-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation".

For Cargo Aircraft shipments add the following statement:

"This shipment is within the limitations prescribed for cargo aircraft only".

The shipping papers shall list the following: the proper shipping name, hazard class, identification number, quantity (by weight, volume or as appropriate), total weight, the radionuclide and activity, the chemical and physical form, the type of label(s) used, the T.I., the type of package used (e.g. "Type A DOT-7A"), and a 24 hour emergency response telephone number. Export shipments shall list all IAEA certifications.

Additional Comments:

- You will notify (within 24 hours) the CECOM Directorate of Safety Risk Management (NRC license requirement) and the receiving installation upon shipment and receipt of the AN/UDM-1 RADIAC Calibrator Set.

- CECOM Directorate of Safety Risk Management: Voice: Comm: (732) 427-3112, DSN: 987-3 112; Fax: Comm: (732) 542-7161 or (732) 532-6403, DSN: 992-6403.

- Ensure you use the corrected (decayed) activity for transportation.

AN/UDM-1A RADIAC CALIBRATOR SET
NSN: 6665-00-556-8825

******IMPORTANT NOTE******

The shipment of the AN/UDM- 1A RADIAC Calibrator Set may require the use of a Type B shipping container, before you initiate a shipment request, you will contact the CECOM Directorate of Safety Risk Management for shipper requirements concerning the Quality Assurance (QA) program for use of this Type B shipping container.

******IMPORTANT NOTE******

Isotope and Maximum Activity: Cs-137,4.44 TBq (120 Ci).

Basic Description: Radioactive material, Special Form, n.o.s., 7, UN2974.

Chemical and Physical Form: Cesium-137 metal, special form, solid.

Package Requirements:

Packaging: Type B. You will coordinate the packaging of the AN/UDM-1A for shipment with the CECOM Directorate of Safety Risk Management to ensure compliance with NRC license/QA program requirements for Type B shipping containers.

Package Labels: Two each Radioactive Yellow III and a Cargo Aircraft Only label. Do not affix labels to the top or bottom of the package. Complete the required information on the Radioactive Yellow III label.

Package Marking:

- Type B, Radioactive Material, Special Form, n.o.s., 7, UN2974, RQ (markings shall be at least ½" in height). Gross weight shall be marked on package. Your unit's name and address shall be marked on the package. Exports shall be marked "USA".

- For shipment by water, after "n.o.s." add "(Cesium-137)".

Survey Requirements:

Radiation Survey: Required prior to shipment and upon receipt.

- For Yellow III Labels: The surface radiation level should be greater than 0.5 mSv (50 mrem/hr), but shall not exceed 2 mSv/hr (200 mrem/hr) and the Transport Index (T.I.) should be greater than 1.0 and shall be less than 10.

Contamination Wipe Survey: Required prior to shipment only.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment **is not** permitted aboard passenger-carrying aircraft.

Vehicle Placarding: RADIOACTIVE placard required on all 4 sides of the vehicle.

Shipping Paper Documentation: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This is to certify that the herein-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation".

For Cargo Aircraft shipments add the following statement:

"This shipment is within the limitations prescribed for cargo aircraft only".

The shipping papers shall list the following: the letters "RQ", the proper shipping name, hazard class, identification number, quantity (by weight, volume or as appropriate), total weight, radionuclide and activity, chemical and physical form, the type of label used, the T.I., the type of package used (e.g., "Type B"), and a 24 hour emergency response telephone number. Export shipments shall list all IAEA certifications.

Additional Comments:

- You will notify (within 24 hours) the CECOM Directorate of Safety Risk Management (NRC license requirement) and the receiving installation upon shipment and receipt of the AN/UDM- 1A RADIAC Calibrator Set.

- CECOM Directorate of Safety Risk Management: Voice: Comm: (732) 427-3112, DSN: 987-3112: Fax: Comm: (732) 542-7161 or (732) 532-6403, DSN: 992-6403.

- Ensure you use the corrected (decayed) activity for transportation.

AN/UDM-2 RADIAC CALIBRATOR SET
NSN: 6665-00-179-9037

Isotope and Activity: Sr-90, 6.66 x 10^9 Bq, (180 mCi).

Basic Description: Radioactive material, Special Form, n.o.s., 7, UN2974.

Chemical and Physical Form: Sr-90 ceramic microspheres, special form, solid.

Package Requirements:

Packaging: Type A DOT-7A.

Package Label: Two Radioactive Yellow II labels and a Cargo Aircraft Only label. Do not affix labels to the top or bottom of the package. Complete the required information on the Radioactive Yellow II label.

Package Marking: Type A DOT-7A Radioactive Material, Special Form, n.o.s., UN2974, RQ (markings shall be at least ½" in height). Your unit's name and address must be marked on the package. Exports shall be marked "USA".

Survey Requirements:

Radiation Survey: Required prior to shipment.

- For Yellow II Labels: The radiation level at any point on the external surface of the package should be greater than 0.005 mSv/hr (0.5 mrem/hr) but shall be less than 0.5 mSv/hr (50 mremhr). The Transport Index (T.I.) shall be less than or equal to 1.0.

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed surface contamination on the external surface of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment **is not** permitted aboard passenger-carrying aircraft.

Vehicle Placarding: Not required.

Shipping Paper Documentation: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation".

For Cargo Aircraft shipments add the following statement:

"This shipment is within the limitations prescribed for cargo aircraft only".

The shipping papers shall list the following: the letters "RQ", the proper shipping name, hazard class, identification number, quantity (by weight, volume or as appropriate), total weight, the radionuclide and activity, the chemical and physical form, the type of label(s) used, the T.I., the type of package used (e.g. "Type A DOT-7A"), and a 24 hour emergency response telephone number. Export shipments shall list all IAEA certifications.

Additional Comments:

- Retain original Type A DOT-7A metal casing, packaging and foam pack received.

- Type A DOT-7A packages shall he sealed with fiber tape.

- If a fiberboard overpack is used, the words: "Type A DOT 7A Container Within" shall be placed on the overpack with all other required markings.

- There is a maximum limit of 30 AN/UDM-2 RADIAC Calibrator Sets that you may ship per package.

- You will notify (within 24 hours) CECOM Directorate of Safety Risk Management and the receiving installation upon shipment and receipt of the AN/UDM-2 RADIAC Calibrator Set.

- CECOM Directorate of Safety Risk Management: Voice: Comm: (732) 427-3112, DSN: 987-3112; Fax: Comm: (732) 542-7161 or (732) 532-6403, DSN: 992-6403.

AN/UDM-6 RADIAC CALIBRATOR SET
NSN: 6665-00-767-7497

Isotope and Activity: Pu-239, 5.18E04 Bq (1.40 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Plutonium-239 nitrate, normal form, solid.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word 'RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 2.2 dpmcm^2 (alpha).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- There is a maximum of 3 each AN/UDM-6 RADIAC Calibrator Sets that you may ship per package.

- You will notify (within 24 hours) CECOM Directorate of Safety Risk Management and the receiving installation upon shipment and receipt of the AN/UDM-6 RADIAC Calibrator Set.

- CECOM Directorate of Safety Risk Management: Voice: Comm: (732) 427-3112, DSN: 987-3 112; Fax: Comm: (732) 542-7161 or (732) 532-6403, DSN: 992-6403.

CS-1 CHECK SOURCE
NSN: 6665-00-903-7732

Isotope and Activity: Pu-239, 3.70E02 Bq (0.01 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Pu-239 oxide electroplated on metal, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 2.2 dpm/cm^2 (alpha).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- There is a maximum of 541 CS-1 Check Sources that you may ship per package.

- You may mail (USPS) up to 54 CS-1 Check Sources per package. All other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

CS-12 CHECK SOURCE
NSN: 6665-00-802-9126

Isotope and Activity: Th-232, 3.70E02 Bq (0.01 µCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910

Chemical and Physical Form: Th-232 oxide electroplated on metal, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, excepted package - limited quantity of material, UN2910".

Additional Comments:

- There is no limit to the number of CS-12 Check Sources that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level on the external surface of the package to less than 0.005 mSv/hr (0.5 mrem/hr).

- You may mail (USPS) as many CS-12 Check Sources as necessary. All other 49 CFR conditions applicable to excepted packages for limited quantities of Class 7 materials apply.

MX-7338/PDR-27(*) RADIOACTIVE TEST SAMPLE
NSN: 6665-00-832-6159

Isotope and Activity: Kr-85, 1.85E08 Bq (5.0 mCi).

Basic Description: Radioactive material, excepted package - limited quantity of material, 7, UN2910.

Chemical and Physical Form: Normal form (gas).

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: The word "RADIOACTIVE" is required on the outside of the inner packaging or if there is no inner packaging, on the outside of the packaging itself.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at any point on the external surface of the packaging shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and 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".

Additional Comments:

- There is a maximum limit of 54 MX-7338 Radioactive Test Samples that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level on the external surface of the package to less than 0.005 mSv/hr (0.5 mrem/hr).

- You may mail (USPS) up to 5 MX-7338 Radioactive Test Samples per package, All other 49 CFR conditions applicable to excepted package - limited quantity shipment apply.

(*) Model numbers (A, G, J, L, P, O, R, S)

RADIUM DEVICES*

Isotope and Activity: Ra-226, Various Activities, See Appendix C.

Basic Description: Radioactive material, excepted package - instruments or articles, 7, UN29 10.

Chemical and Physical Form: Radioluminous paint, solid, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: Exempt.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article shall not exceed 0.1 mSv/hr (10 mrem/hr).

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 2.2 dpm/cm* (alpha).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package - instruments or articles, UN2910".

*Radium devices with NSN: 5840-00-559-6288 are excluded from this procedure and shall be shipped IAW Title 49 CFR Part 172, Subparts A through F and Part 173, Subpart I.

Additional Comments:

- There is a maximum of 2.0E07 Bq (540 µCi) total activity for Ra-226 that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level on the surface of the package to less than 0.005 mSv/hr (0.5 mrem/hr).

- For the activities of RAM in each end article containing radium, refer to Appendix C or consult TB 43-0116, Identification of Radioactive Items in the Army.

- You may mail (USPS) up to 2.0E06 Bq (54 µCi) total activity of Ra-226 per package; all other 49 CFR conditions applicable to excepted packages for radioactive instruments and articles apply.

NIGHT VISION DEVICES (NVD)

Isotope and Activity: Th-232, Various Activities, See Appendix D.

Basic Description: Radioactive material, excepted package - instruments or articles, 7, UN2910.

Chemical and Physical Form: Th232 oxide or ThF1 coating, normal form.

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: Exempt.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article shall not exceed 0.1 mSv/hr (10 mrem/hr).

- The radiation level at any point of the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed surface contamination on the external surface of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

"This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package - instruments or articles, UN2910".

Additional Comments:

- There is no limit to the number of NVDs that you may ship per package.

- You may use a larger box or additional shielding to reduce the radiation level to less than 0.005 mSv/hr (0.5 mrem/hr).

- For the activities of RAM in each end article containing thorium, refer to Appendix D or consult TB 43-0116, Identification of Radioactive Items in the Army.

- You may mail (USPS) as many NVDs per package as necessary. All other 49 CFR conditions applicable to excepted packages for radioactive instruments and articles apply.

TRITIUM COMPASSES
NSN: 6605-00-151-5337
NSN: 6605-01-096-6971
NSN: 6605-00-846-7618

Isotope and Activity: H-3, 6605-00-151-5337, 7.03E09 Bq (190 mCi)
H-3, 6605-01-096-6971, 4.44E09 Bq (120 mCi)
H-3, 6605-00-846-7618, 4.44E09 Bq (120 mCi) or
2.78E09 Bq (75 mCi) or
1.85E09 Bq (50 mCi)

Basic Description: Radioactive material, excepted package - instruments or articles, 7, UN2910.

Chemical and Physical Form: Tritium paint, solid, normal form (6605-00-846-7618) Tritium gas, normal form (6605-00-151-5337 and 6605-01-096-6971).

Package Requirements:

Packaging: Excepted Packaging.

Package Label: Exempt.

Package Marking: Exempt.

Survey Requirements:

Radiation Survey: Required prior to shipment.

- The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article shall not exceed 0.1 mSv/hr (10 mrem/hr).

- The radiation level at any point on the external surface of the package shall not exceed 0.005 mSv/hr (0.5 mrem/hr).

Contamination Wipe Survey: Required prior to shipment.

- The non-fixed radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm^2 (beta).

Transportation Requirements: Shipment is permitted aboard passenger-carrying aircraft, per 49 CFR 173.422.

Vehicle Placarding: Not required.

Additional Requirements: You will certify this radioactive material for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice will include the name of the consignee and the statement:

“This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package - instruments or articles, UN2910”.

Additional Comments:

- There is a maximum of 7.99E12 Bq (216 Ci) total activity for H-3 that you may ship per package.

- You may mail (USPS) up to 7.99E11 Bq (2 1.6 Ci) total activity of H-3 per package; all other 49 CFR conditions applicable to excepted packages for radioactive instruments and articles apply.

APPENDIX A

REFERENCES

AR 55-38	Reporting of Transportation Discrepancies in Shipments.
AR 385-11	Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety).
AR 700-64	Radioactive Commodities in the DOD Supply Systems,
AR 735-11-2	Reporting of Item and Packaging Discrepancies.
TB 43-0116	Identification of Radioactive Items in the Army
TM 3-261	Handling and Disposal of Unwanted Radioactive Material.
TM 38-250	Packaging and Materials Handling: Preparation of Hazardous Materials for Military Air Shipment.
TM 55-315	Transportability Guidance for Safe Transport of Radioactive Materials.
Title 10	Energy, Code of Federal Regulations.
Title 49	Transportation, Code of Federal Regulations.

APPENDIX B

CECOM

RADIOACTIVE COMMODITY

NSN TO TYPE NUMBER SEQUENCE

CROSS REFERENCE

APPENDIX B

NSNs CROSS REFERENCED TO SECTION II TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ISOTOPE	ACTIVITY IN Bq
6625008563466	6665008326159	ANPDR 27	SOURCE	KR85	1.85E 8
6665000178903	6665008326159	ANPDR 27Q	SOURCE	KR85	1.85E 8
6665001799037		ANUDM 2	RAD CALIB	SR90	6.66E 9
6665002118695		ANPDR 56F	SOURCE	TH232	8.70E 3
6665005265334	6665008326159	ANPDR 27A	SOURCE	KR85	1.85E 8
6665005268648		ANPDR 39	SOURCE	SR90	1.85E 4
6665005421587		ANPDR 60	RADIA SET	TH232	4.44E 4
6665005431435	6665008326159	ANPDR 275	SOURCE	KR85	1.85E 8
6665005431443	6665006841199	ANPDR 27G	SOURCE	RA226	2.59E 5
6665005431443	6665008326159	ANPDR 27G	SOURCE	KR85	1.85E 8
6665005568825		ANUDM 1A	RAD CALIB	CS137	4.44E12
6665005615887	6665006841199	ANPDR 27	SOURCE	RA226	2.59E 5
6665005615887	6665008326159	ANPDR 27	SOURCE	KR85	1.85E 8
6665006690077		ANUDM 1	RAD CALIB	CO60	3.70E11
6665007677497		ANUDM 6	RAD CALIB	PU239	5.18E 4
6665008029126		CS-12	SOURCE	TH232	3.70E 2
6665008563456	6665008326159	ANPDR 27L	SOURCE	KR85	1.85E 8
6665009037732		CS- 1	SOURCE	PU239	3.70E 2
6665009610846	6665008326159	ANPDR 27R	SOURCE	KR85	1.85E 8
6665009651516	6665009037732	ANPDR 60	RADIA SET	PU239	3.70E 2
6665009757222	6665008326159	ANPDR 27P	SOURCE	KR85	1.85E 8
6665010804418	6665008326159	ANPDR 27S	SOURCE	KR85	1.85E 8
6665010847777		ANUDM 7C	RAD CALIB	PU239	1.86E 6
6665011139530		ANPDR 56F	SOURCE	TH232	8.70E 3

APPENDIX C

CECOM

RADIUM COMMODITY

NSN SEQUENCE TO TYPE NUMBER

CROSS REFERENCE

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
1290005032612	6605004939203	ANTNS 3	COMPASS	2.66E 5
4920008925977	5930006551514	ANASM 70	T.S.	5.55E 3
5355001631617		NTN	KNOB	4.81E 3
5355001639955		NTN	KNOB	4.81E 3
5355004049678		NTN	KNOB	4.81E 3
5355005520451		NTN	KNOB	4.81E 3
5355005596288		NTN	DIAL SCAL	5.81E 5
5355006304660	6625005554385	NTN	METER ARB	6.293 3
5355006679207		NTN	KNOB	4.81E 3
5411007532889		S 186		4.03E 4
5805001616617		MT-313/GT	PLUG	5.553 5
5805001616649		U-4/GT	ADAPTER	5.553 5
5805006653436		ANFGC 1		4.03E 4
5805008688214	5930006551582	ANTCC 61	T.S.	5.553 3
5805008778741	5930006551582	ANTCC 61	T.S.	5.553 3
5815000698914		ANVSC 2		1.70E 5
5815000824205		ANGRC 46C		1.16E 5
5815001677998		ANGRC122A		1.92E 5
5815001681556		ANGRC142A		1.92E 5
5815002248129		ANVSC 2		1.70E 5
5815002248130		ANVSC 3		1.91E 5
5815003997223		ANGRC 26		4.03E 4
5815004019719		ANGRC122 LP		1.92E 5
5815004019720		ANGRC142		1.92E 5
5815004019721		ANVRC 29		1.11E 5
5815004435511		ANGRC142B		1.92E 5
5815005180398		ANGRC 26D LP		4.03E 4
5815005373948		CV278		1.70E 4
5815005431728		CV278/GR		1.70E 4
5815005431758		ANVRC 29		1.11E 5
5815005431760		ANGRC 46		1.16E 5
5815006819711		ANGRC 26D		4.03E 4
5815006819771		ANGRC 26		4.03E 4
5815007888540		ANVSC 3		1.91E 5
5815008688242		ANGRC122		1.92E 5
5815008894223		ANVSC 1		1.06E 5
5815009194800		MD522A/GR		7.40E 4
5815009375295		ANGRC122B		1.92E 5
5815009375297		ANGRC122		1.92E 5
5815009995277		MD522 /GRC		7.40E 4
5815010951211		ANGRC122C		1.92E 5
5815010951212		ANGRC122E		1.92E 5
5815010956258		ANGRC142E		1.92E 5
5815010960428		ANGRC122D		1.92E 5
5815011006815		ANGRC142C		1.92E 5
5815011025916		ANVSC 3A		1.91E 5

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5815011047264		ANGRC142D		1.92E 5
5815011423079		ANGRC142F		1.92E 5
5820000140018	6625006182068	4O A 1551	METER ARB	1.11E 3
5820000300155		ANGRC 19		9.40E 4
5820000698912		ANMRC 73 LP		1.57E 5
5820000698941		ANTRC117		1.17E 5
5820000784771		AM 3349	AMP RADIO	1.11E 5
5820000823828	6625002235244	ANMRC 67 A	METER MLT	1.85E 3
5820000823847	6625006182068	R 744 A	METER ARB	1.11E 3
5820000879786		NTN	T.S.	3.70E 4
5820000897358		ANTRR 18 LP		4.03E 4
5820001086292		ANMRC 73 A		1.57E 5
5820001086293		ANMRC 69 AV		1.57E 5
5820001086295		ANMRC 69 AV1		1.57E 5
5820001447842		ANTRC111 LP		1.48E 5
5820001486150		ANMRC 54 AV1		1.57E 5
5820001558570		ANMRC 73A V1		1.57E 5
5820001646368	6625005389575	R 19	METER AMM	9.623 3
5820001647136	6625008891585	AM 8	METER AMM	9.623 3
5820001647146	6625008891585	ANTRA 1	METER AMM	9.623 3
5820001677936		ANTRC117		1.17E 5
5820001677999	5930006551582	ANTRC109 LP	T.S.	5.553 3
5820001678002	5930006551582	ANTRC108	T.S.	5.553 3
5820001678003		ANGRC106		1.55E 5
5820001678005		ANGRC106A		1.55E 5
5820001681557		ANTRC 80 LP		6.11E 5
5820001681558		ANTRC 90		6.11E 5
5820001681559		ANTRC 90A		6.11E 5
5820001681560		ANTRC 90B		6.11E 5
5820001681561		ANTRC112 LP		1.70E 5
5820001681562		ANTRC121		1.33E 5
5820001681563		ANTRC129 LP		1.11E 4
5820001681564		ANTRC129A LP		1.11E 4
5820001689544	5930006551582	ANTRC110 PCM	T.S.	5.553 3
5820001897055	6625006688145	TSC 653A	METER VLT	1.15E 4
5820001927109		ANVRC 15X		6.663 3
5820001927110		ANVRC 14 12V		6.663 3
5820001927111		ANVRC 15		6.66E 3
5820001927133		ANVRC 13		6.663 3
5820001927134		ANVRC 13X		6.66E 3
5820001938402		ANVRC 10 24V		6.663 3
5820001938406		ANVRC 13 24V		6.663 3
5820001938409		ANVRC 15 24V		6.663 3
5820001938410		ANVRC 16 24V		6.663 3
5820001938412		ANVRC 17 24V		6.663 3

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5820001938420		ANVRC 18 24V		6.66E 3
5820001938809		ANVRC 9		6.66E 3
5820001938811		ANVRQ 3		1.22E 4
5820001938830		ANVRQ 1X12V		1.22E 4
5820001938831		ANVRQ 3X		1.22E 4
5820001938838		ANVRQ 2		1.22E 4
5820001938839		ANVRQ 2X		1.22E 4
5820001938844		ANGRC 9		1.70E 4
5820001938845		ANGRC 9		1.70E 4
5820001961718		ANVRC 8 24V		6.66E 3
5820001961719		ANVRC 8 12V		6.66E 3
5820001961721		ANVRC 10		6.66E 3
5820001969038		ANVRC 10X		6.66E 3
5820001969039		ANVRC 9X12V		6.66E 3
5820001976532		ANVRC 14		6.66E 3
5820002207551		ANVRC 8		6.66E 3
5820002226404		ANVRQ 1		1.22E 4
5820002226416		ANGRC 7		1.70E 4
5820002226417		ANGRC 6		1.70E 4
5820002237409		ANGRC 19		9.40E 4
5820002237433		ANVRC 46		9.40E 4
5820002237477		ANGRC 3 24V		1.70E 4
5820002237519		ANGRC 4 24V		1.70E 4
5820002237520		ANGRC 5 24V		1.70E 4
5820002237544		ANGRC 6 24V		1.70E 4
5820002237545		ANGRC 7 24V		1.70E 4
5820002237546		ANGRC 8 24V		1.70E 4
5820002237551		ANVRC 8 24V		6.66E 3
5820002237559		ANVRC 9 24V		6.66E 3
5820002237560		ANVRC 14 24V		6.66E 3
5820002237563		ANVRC 21 24V		8.51E 3
5820002237564		ANVRC 22 24V		6.66E 3
5820002237565		ANVRC 35		1.22E 4
5820002237566		ANVRC 38		5.40E 4
5820002237568		ANVRQ 1 24V		1.22E 4
5820002237615		ANVRQ 2 24V		1.22E 4
5820002237637		ANVRQ 3 24V		1.22E 4
5820002300445		ANGRC 8 12V		1.70E 4
5820002300446		ANGRC 7		1.70E 4
5820002300448		ANGRC 6 12V		1.70E 4
5820002300449		ANGRC 5		1.70E 4
5820002300454		ANGRC 8		1.70E 4
5820002300459		ANGRC 3 12V		1.70E 4
5820002300460		ANGRC 5 12V		1.70E 4
5820002346396		ANVRC 17 12V		6.66E 3
5820002346397		ANVRC 18X12V		6.66E 3
5820002346398		ANVRC 16 12V		6.66E 3
5820002346399		ANVRC 18		6.66E 3
5820002346869		ANVRC 16		6.66E 3

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5820002436417		ANGRC 4 12V		1.70E 4
5820002436418		ANGRC 4		1.70E 4
5820002536131		ANVRC 16		6.66E 3
5820002635405		ANGRC 9		1.70E 4
5820003093221		ANGLQ 2 LP		4.22E 4
5820003513384		ANVRC 17		6.66E 3
5820004022263		ANGRC106	RADIO SET	1.55E 5
5820004022265		ANVRC 55		5.22E 4
5820004641616	6625005553095	ANTRC133A	METER VLT	2.04E 4
5820005004378		PP 685		1.27E 5
5820005010495	6625007528075	ANTRC 1	METER AMM	1.48E 4
5820005031092		OA 483		2.11E 4
5820005031095		ANTRC 35		1.57E 5
5820005031113		ANGLQ 2		4.22E 4
5820005031133		ANTRC 24		1.57E 5
5820005031242		R390/URR		4.03E 4
5820005031250		R392/URR		4.18E 4
5820005031256		R 391		4.03E 4
5820005031403	6625002235244	R 520	METER MLT	1.85E 3
5820005031417	6625006690769	R 389 /URR	METER AUD	2.553 4
5820005031496		ANFRR 34		4.03E 4
5820005031497		ANFRR 38		8.07E 4
5820005031500		ANFRR 45		4.03E 4
5820005031505	6625002235244	RT 68	METER MLT	1.85E 3
5820005031507	6625002235244	RT 67	METER MLT	1.85E 3
5820005031508	6625002235244	RT 66	METER MLT	1.85E 3
5820005031513		ANFRR 41		1.26E 5
5820005031515	5355006169659	ANFRR 39	KNOB	4.81E 3
5820005031518	5355006169659	RT 70	KNOB	4.81E 3
5820005032578		ANTRC 35		1.57E 5
5820005032591		ANVRC 20		6.66E 3
5820005032594		CV157		4.51E 4
5820005033295		T 302		3.26E 4
5820005033428		T 195		5.22E 4
5820005033960		R 417		4.00E 4
5820005118151		ANURR 29X		2.65E 5
5820005193939		R 660/URR		2.59E 5
5820005194101		ANTRC 22		6.66E 3
5820005194102		ANVRC 21		8.51E 3
5820005194104		ANVRC 20		6.66E 3
5820005194105		ANVRC 20		6.66E 3
5820005323984		ANVRC 17		6.66E 3
5820005323985		ANVRC 22		6.66E 3
5820005323987		ANVRQ 1		1.22E 4
5820005323988		ANTRC 36		1.57E 5
5820005323989		ANTRC 24 LP		1.57E 5
5820005374004		ANVRC 21		8.51E 3
5820005387555		R 390A/URR		4.03E 4
5820005427205		ANURR 29		2.65E 5

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5820005427297		ANMRC 54 V		1.57E 5
5820005427298		ANMRC 69 A		1.57E 5
5820005430057		ANTRC 35		1.57E 5
5820005430078		ANGRC 41 LP		4.03E 4
5820005430166		OA 1387		1.57E 5
5820005431514	6625006182068	R 744	METER ARB	1.11E 3
5820005431784		ANGRC 3		1.70E 4
5820005457307		ANGRC 3		1.70E 4
5820005457312		ANGRC 4		1.70E 4
5820005457314		ANGRC 7		1.70E 4
5820005457325		ANFRR 40		8.55E 4
5820005690031		ANTRC 36		1.57E 5
5820005812104		ANGRC 75		1.57E 5
5820005812105		ANGRC 78		1.57E 5
5820006065768		ANVRC 35		1.22E 4
5820006428144		R 220 /URR		2.59E 5
5820006650944	6625005004589	C 434	METER ARB	5.55E 3
5820006652455	6625005389575	R 19 A	METER AMM	9.62E 3
5820006652466	6625005389575	R 19 B	METER AMM	9.62E 3
5820006698306	6625005389575	R 19	METER AMM	9.62E 3
5820006819531		ANVRC 38		5.40E 4
5820006993245		ANGRC 41		4.03E 4
5820007765406		ANTRA 25		1.57E 5
5820007885267	5930006551582	ANMRC103 LP	T.S.	5.55E 3
5820007888543		ANTRR 18		4.03E 4
5820008569911		ANTRA 25B		1.57E 5
5820008688154		ANTRC112		1.70E 5
5820008688196		ANTRC121		1.33E 5
5820008688208	5930006551582	ANTRC110 WPC	T.S.	5.55E 3
5820008688209	5930006551582	ANTRC109V	T.S.	5.55E 3
5820008692373	5930006551582	ANTRC10BV	T.S.	5.55E 3
5820008788634	5930006551582	ANGRC 50AV10	T.S.	5.55E 3
5820008788635	5930006551582	ANGRC 50A V9	T.S.	5.55E 3
5820008890857	5930006551514	PP2054	T.S.	5.55E 3
5820008893884		ANMRC 69 LP		1.57E 5
5820008920698		OA 1387		1.57E 5
5820008920871		ANGRC 46		1.16E 5
5820008920881		ANGRC109		1.92E 5
5820008923470		ANTRC 80		6.11E 5
5820008923476		ANMRT 9		4.03E 4
5820008923479		ANMRR 8		4.03E 4
5820008923493		ANMRC 73 V		1.57E 5
5820008923748		ANTRC 90		6.11E 5
5820008923851	5930006551582	ANGRC 50 V1	T.S.	5.55E 3
5820008923852	5930006551582	ANGRC 50 V2	T.S.	5.55E 3
5820008923853	5930006551582	ANGRC 50 V3	T.S.	5.55E 3
5820008923854	5930006551582	ANGRC 50 V4	T.S.	5.55E 3
5820008923855	5930006551582	ANGRC 50 V5	T.S.	5.55E 3
5820009260180	6625006690769	R 725	METER AUD	2.55E 4

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5820009267274	5930006551582	ANTRC110 FDM	T.S.	5.55E 3
5820009303598	6625005553095	ANTRC133	METER VLT	2.04E 4
5820009336189	5930006551582	ANGRC 50A V5	T.S.	5.55E 3
5820009336190	5930006551582	ANGRC 50A V4	T.S.	5.55E 3
5820009336191	5930006551582	ANGRC 50A V3	T.S.	5.55E 3
5820009336192	5930006551582	ANGRC 50A V2	T.S.	5.55E 3
5820009336193	5930006551582	ANGRC 50A V1	T.S.	5.55E 3
5820009350033	6625002265680	RT 834	METER AUD	2.22E 4
5820009350089	5930006551582	ANGRC 50A V8	T.S.	5.55E 3
5820009350132		ANTRC 95		4.03E 4
5820009350146		ANTRC 95		4.03E 4
5820009365480	5930006551582	ANGRC 50A V6	T.S.	5.55E 3
5820009365481	5930006551582	ANGRC 50A V7	T.S.	5.55E 3
5820009380225		ANTRC 80A LP		6.11E 5
5820009380226		ANTRC 80B LP		6.11E 5
5820009436514	6625002235244	ANGRC 39	METER MLT	1.85E 3
5820009655480	5930006551582	ANGRC 50	T.S.	5.55E 3
5820009730120		ANVRC 55		5.22E 4
5820009991796		ANMRC 54		1.57E 5
5820009996091		ANMRT 9		4.03E 4
5820009996093		ANMRR 8 LP		4.03E 4
5821009014327	6610008398638	MK 733	INDICATOR	5.55E 4
5821009350058	6610008398638	MK1035	INDICATOR	5.55E 4
5821009374686	6610008398638	ANARC131	INDICATOR	5.55E 4
5825000140184	6625006182068	OA 1451A/PRR	METER ARB	1.11E 3
5825000698763	6625006690769	ANTRD 15	METER MLT	2.55E 4
5825002792930		NTN	C.B.	3.70E 4
5825003093204		ANTRD 4A		4.03E 4
5825004915253	6625006690769	ANTRD 23A	METER AUD	2.55E 4
5825004915254	6625006690769	ANTRD 15A	METER MLT	2.55E 4
5825005431513	6625006182068	OA 1451/PRR	METER ARB	1.11E 3
5825007082221	6625002235244	ANTRD 17	METER MLT	1.85E 3
5825008934299		NTN	C.B.	3.70E 4
5825009260160		ANTRD 4		4.03E 4
5826000366504	6610008398638	ID 48A	INDICATOR	5.55E 4
5826003309656	6610008398638	ID 48	INDICATOR	5.55E 4
5826005196967	6625005554385	ANARN 59	METER ARB	6.29E 3
5826005430451	6610008398638	ANARN 30A	INDICATOR	5.55E 4
5826005430622	6625005554385	ANARN 59	METER ARB	6.29E 3
5826005534257	6610008398638	ANARN 30	INDICATOR	5.55E 4
5826005535925	6625005554385	C2275	METER ARB	6.29E 3
5826006886030	6625005554385	C2275	METER ARB	6.29E 3
5826007525814	6610008398638	ANARN 30D	INDICATOR	5.55E 4
5826008835759	6625005554385	ANARN 59	METER ARB	6.29E 3
5826008840887	6610008398638	ANARN 30	INDICATOR	5.55E 4
5826008921056	6610008398638	ANARN 30E	INDICATOR	5.55E 4
5830001602465		C 104		2.22E 4
5830001641276		AM 34		1.11E 4
5830001646618		ANTIQ 2		7.03E 4

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5830001646619		ANTIQ 3		2.16E 5
5830001646622		ANTIQ 2A		7.03E 4
5830001646626		AM 20		5.92E 4
5830001707868	5355004049678	C 375	KNOB	4.81E 3
5830002297124	5930001631617	C 664	KNOB	4.81E 3
5830002430816	5930001631617	C 665	KNOB	4.81E 3
5830002542155		AM 700		1.11E 4
5830005031002		C1090		9.99E 4
5830005031108	5930001631617	C 663	KNOB	4.81E 3
5830005031109	5355001639955	C 981	KNOB	4.81E 3
5830005082151		ANVIA 4		1.44E 4
5830005397728		ANVIA 1		1.44E 4
5830006909705		ANTIQ 2B		7.03E 4
5830009432415		ANTIQ 3A LP		2.16E 5
5835001282762		MX- 39		1.11E 4
5835006140650	6625005004585	RO 28	METER ARB	5.55E 3
5835007891454	6625005004585	RO 28	METER ARB	5.55E 3
5835008923510	6625005004585	ANUNH 6	METER ARB	5.55E 3
5840000698811	6625002235244	ANSPN 11	METER MLT	1.85E 3
5840000823932		MD594		1.11E 4
5840000920953		OA 800		4.18E 4
5840001378336	6625005733786	ANSPS 56	METER VLT	8.88E 3
5840003785006	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005031078		ANGSS 1		4.18E 4
5840005031086	6625001937160	ANMPQ 10	METER MLT	3.00E 4
5840005033392	6625001937160	KY 78	METER VLT	3.00E 4
5840005033528	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033529	6625002235244	ANSPN 1lZ	METER MLT	1.85E 3
5840005033530	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033531	6625002235244	ANSPN 11Y	METER MLT	1.85E 3
5840005033532	6625002235244	ANSPN 11X1	METER MLT	1.85E 3
5840005050737	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005051086	6625001937160	ANMPQ 10A	METER VLT	3.00E 4
5840005051852A	5930006551514	ANFPS 4	T.S.	5.553 3
5840005051852B	5930006551514	ANFPS 36	T.S.	5.553 3
5840005342869	6625001937160	SB 212	METER VLT	3.00E 4
5840005427128	5930006551514	ANFPS 56	T.S.	5.55E 3
5840005430750	6625005004585	ANMPQ 4A LP	METER ARB	5.55E 3
5840005430159	6625005004585	ANMPQ 4	METER ARB	5.55E 3
5840005457252	6625002235244	R 572	METER MLT	1.85E 3
5840005457259	6625002235244	ANSPN 11X2	METER MLT	1.85E 3
5840005457327	6625001937160	ANMPQ 16	METER VLT	3.00E 4
5840005596288		NTN	DIAL SCAL	3.70E 7
5840005626274		ANFPN 33		7.92E 4
5840005628880	6625005785612	T 626	METER AMM	2.33E 4
5840005628903	5930006551514	ANFPS 36	T.S.	5.55E 3
5840005674624	6625005538190	PP 607	METER AMM	3.70E 1
5840006426799	6625002235244	R 480	METER MLT	1.85E 3

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5830001646619		ANTIQ 3		2.16E 5
5830001646622		ANTIQ 2A		7.03E 4
5830001646626		AM 20		5.92E 4
5830001707868	5355004049678	C 375	KNOB	4.81E 3
5830002297124	5930001631617	C 664	KNOB	4.81E 3
5830002430816	5930001631617	C 665	KNOB	4.81E 3
5830002542155		AM 700		1.11E 4
5830005031002		C1090		9.99E 4
5830005031108	5930001631617	C 663	KNOB	4.81E 3
5830005031109	5355001639955	C 981	KNOB	4.81E 3
5830005082151		ANVIA 4		1.44E 4
5830005397728		ANVIA 1		1.44E 4
5830006909705		ANTIQ 2B		7.03E 4
5830009432415		ANTIQ 3A LP		2.16E 5
5835001282762		MX- 39		1.11E 4
5835006140650	6625005004585	RO 28	METER ARB	5.55E 3
5835007891454	6625005004585	RO 28	METER ARB	5.55E 3
5835008923510	6625005004585	ANUNH 6	METER ARB	5.55E 3
5840000698811	6625002235244	ANSPN 11	METER MLT	1.85E 3
5840000823932		MD594		1.11E 4
5840000920953		OA 800		4.18E 4
5840001378336	6625005733786	ANSPS 56	METER VLT	8.88E 3
5840003785006	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005031078		ANGSS 1		4.18E 4
5840005031086	6625001937160	ANMPQ 10	METER MLT	3.00E 4
5840005033392	6625001937160	KY 78	METER VLT	3.00E 4
5840005033528	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033529	6625002235244	ANSPN 1lZ	METER MLT	1.85E 3
5840005033530	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033531	6625002235244	ANSPN 11Y	METER MLT	1.85E 3
5840005033532	6625002235244	ANSPN 11X1	METER MLT	1.85E 3
5840005050737	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005051086	6625001937160	ANMPQ 10A	METER VLT	3.00E 4
5840005051852A	5930006551514	ANFPS 4	T.S.	5.553 3
5840005051852B	5930006551514	ANFPS 36	T.S.	5.553 3
5840005342869	6625001937160	SB 212	METER VLT	3.00E 4
5840005427128	5930006551514	ANFPS 56	T.S.	5.55E 3
5840005430750	6625005004585	ANMPQ 4A LP	METER ARB	5.55E 3
5840005430159	6625005004585	ANMPQ 4	METER ARB	5.55E 3
5840005457252	6625002235244	R 572	METER MLT	1.85E 3
5840005457259	6625002235244	ANSPN 11X2	METER MLT	1.85E 3
5840005457327	6625001937160	ANMPQ 16	METER VLT	3.00E 4
5840005596288		NTN	DIAL SCAL	3.70E 7
5840005626274		ANFPN 33		7.92E 4
5840005628880	6625005785612	T 626	METER AMM	2.33E 4
5840005628903	5930006551514	ANFPS 36	T.S.	5.55E 3
5840005674624	6625005538190	PP 607	METER AMM	3.70E 1
5840006426799	6625002235244	R 480	METER MLT	1.85E 3

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5830001646619		ANTIQ 3		2.16E 5
5830001646622		ANTIQ 2A		7.03E 4
5830001646626		AM 20		5.92E 4
5830001707868	5355004049678	C 375	KNOB	4.81E 3
5830002297124	5930001631617	C 664	KNOB	4.81E 3
5830002430816	5930001631617	C 665	KNOB	4.81E 3
5830002542155		AM 700		1.11E 4
5830005031002		C1090		9.99E 4
5830005031108	5930001631617	C 663	KNOB	4.81E 3
5830005031109	5355001639955	C 981	KNOB	4.81E 3
5830005082151		ANVIA 4		1.44E 4
5830005397728		ANVIA 1		1.44E 4
5830006909705		ANTIQ 2B		7.03E 4
5830009432415		ANTIQ 3A LP		2.16E 5
5835001282762		MX- 39		1.11E 4
5835006140650	6625005004585	RO 28	METER ARB	5.55E 3
5835007891454	6625005004585	RO 28	METER ARB	5.55E 3
5835008923510	6625005004585	ANUNH 6	METER ARB	5.55E 3
5840000698811	6625002235244	ANSPN 11	METER MLT	1.85E 3
5840000823932		MD594		1.11E 4
5840000920953		OA 800		4.18E 4
5840001378336	6625005733786	ANSPS 56	METER VLT	8.88E 3
5840003785006	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005031078		ANGSS 1		4.18E 4
5840005031086	6625001937160	ANMPQ 10	METER MLT	3.00E 4
5840005033392	6625001937160	KY 78	METER VLT	3.00E 4
5840005033528	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033529	6625002235244	ANSPN 1lZ	METER MLT	1.85E 3
5840005033530	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033531	6625002235244	ANSPN 11Y	METER MLT	1.85E 3
5840005033532	6625002235244	ANSPN 11X1	METER MLT	1.85E 3
5840005050737	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005051086	6625001937160	ANMPQ 10A	METER VLT	3.00E 4
5840005051852A	5930006551514	ANFPS 4	T.S.	5.553 3
5840005051852B	5930006551514	ANFPS 36	T.S.	5.553 3
5840005342869	6625001937160	SB 212	METER VLT	3.00E 4
5840005427128	5930006551514	ANFPS 56	T.S.	5.55E 3
5840005430750	6625005004585	ANMPQ 4A LP	METER ARB	5.55E 3
5840005430159	6625005004585	ANMPQ 4	METER ARB	5.55E 3
5840005457252	6625002235244	R 572	METER MLT	1.85E 3
5840005457259	6625002235244	ANSPN 11X2	METER MLT	1.85E 3
5840005457327	6625001937160	ANMPQ 16	METER VLT	3.00E 4
5840005596288		NTN	DIAL SCAL	3.70E 7
5840005626274		ANFPN 33		7.92E 4
5840005628880	6625005785612	T 626	METER AMM	2.33E 4
5840005628903	5930006551514	ANFPS 36	T.S.	5.55E 3
5840005674624	6625005538190	PP 607	METER AMM	3.70E 1
5840006426799	6625002235244	R 480	METER MLT	1.85E 3

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5830001646619		ANTIQ 3		2.16E 5
5830001646622		ANTIQ 2A		7.03E 4
5830001646626		AM 20		5.92E 4
5830001707868	5355004049678	C 375	KNOB	4.81E 3
5830002297124	5930001631617	C 664	KNOB	4.81E 3
5830002430816	5930001631617	C 665	KNOB	4.81E 3
5830002542155		AM 700		1.11E 4
5830005031002		C1090		9.99E 4
5830005031108	5930001631617	C 663	KNOB	4.81E 3
5830005031109	5355001639955	C 981	KNOB	4.81E 3
5830005082151		ANVIA 4		1.44E 4
5830005397728		ANVIA 1		1.44E 4
5830006909705		ANTIQ 2B		7.03E 4
5830009432415		ANTIQ 3A LP		2.16E 5
5835001282762		MX- 39		1.11E 4
5835006140650	6625005004585	RO 28	METER ARB	5.55E 3
5835007891454	6625005004585	RO 28	METER ARB	5.55E 3
5835008923510	6625005004585	ANUNH 6	METER ARB	5.55E 3
5840000698811	6625002235244	ANSPN 11	METER MLT	1.85E 3
5840000823932		MD594		1.11E 4
5840000920953		OA 800		4.18E 4
5840001378336	6625005733786	ANSPS 56	METER VLT	8.88E 3
5840003785006	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005031078		ANGSS 1		4.18E 4
5840005031086	6625001937160	ANMPQ 10	METER MLT	3.00E 4
5840005033392	6625001937160	KY 78	METER VLT	3.00E 4
5840005033528	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033529	6625002235244	ANSPN 1lZ	METER MLT	1.85E 3
5840005033530	6625002235244	ANSPN 18	METER MLT	1.85E 3
5840005033531	6625002235244	ANSPN 11Y	METER MLT	1.85E 3
5840005033532	6625002235244	ANSPN 11X1	METER MLT	1.85E 3
5840005050737	6625001937160	ANMPQ 10	METER VLT	3.00E 4
5840005051086	6625001937160	ANMPQ 10A	METER VLT	3.00E 4
5840005051852A	5930006551514	ANFPS 4	T.S.	5.553 3
5840005051852B	5930006551514	ANFPS 36	T.S.	5.553 3
5840005342869	6625001937160	SB 212	METER VLT	3.00E 4
5840005427128	5930006551514	ANFPS 56	T.S.	5.55E 3
5840005430750	6625005004585	ANMPQ 4A LP	METER ARB	5.55E 3
5840005430159	6625005004585	ANMPQ 4	METER ARB	5.55E 3
5840005457252	6625002235244	R 572	METER MLT	1.85E 3
5840005457259	6625002235244	ANSPN 11X2	METER MLT	1.85E 3
5840005457327	6625001937160	ANMPQ 16	METER VLT	3.00E 4
5840005596288		NTN	DIAL SCAL	3.70E 7
5840005626274		ANFPN 33		7.92E 4
5840005628880	6625005785612	T 626	METER AMM	2.33E 4
5840005628903	5930006551514	ANFPS 36	T.S.	5.55E 3
5840005674624	6625005538190	PP 607	METER AMM	3.70E 1
5840006426799	6625002235244	R 480	METER MLT	1.85E 3

APPENDIX C

RA-226 DEVICES

NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
5960003905221		422 A	E.T.	3.70E 3
5960005537091		6542	E.T.	1.85E 3
5960005785241		6542	E.T.	1.85E 3
5960007073336		7988/TD44	E.T.	2.22E 3
5960007545782		7099	E.T.	9.25E 1
5960007549916		6542	E.T.	1.85E 3
5960008000554		6627/OB2WA	E.T.	2.22E 5
5960008288000		5027	E.T.	9.62E 3
5960008288002		NTN	E.T.	l.llE 3
5960008288004		AM3216	E.T.	l.llE 3
5960008525546		TD 78	E.T.	2.22E 3
5960008536468		NTN	E.T.	7.40E 4
5965002436420	5355005520451	LS-166/U	KNOB	4.81E 3
5985001681571		ANMSC 32A LP		4.18E 4
6110000645478	5930006551582	CN514	T.S.	5.55E 3
6115007747342	6625008426532	NTN	METER AMM	4.07E 3
6525001937160		NTN	METER VLT	3.00E 4
6605002378215		NTN	COMPASS	5.55E 5
6605004989203		NTN	COMPASS	2.66E 5
6610005669684		NTN	ALTIMETER	6.29E 3
6610008398638		ID 48/ARN	INDICATOR	5.55E 4
6620001559042		NTN	INDICATOR	1.74E 4
6620008201495B		NTN	INDICATOR	5.55E 5
6620009304048		NTN	METER VLT	4.07E 4
6625000487693B		NTN	METER	3.70E 4
6625000683493		NTN	METER VLT	3.70E 3
6625000689751		NTN	METER AMM	1.52E 4
6625001749145		NTN	METER VLT	1.92E 4
6625001883730		NTN	METER AMM	3.70E 4
6625001937160		NTN	METER VLT	3.00E 4
6625001991784		NTN	METER VLT	3.70E 4
6625002235244		NTN	METER MLT	1.85E 3
6625002265679		NTN	METER ARB	3.70E 4
6625002265680		NTN	METER AUD	2.22E 4
6625002265681		NTN	METER ARB	3.70E 4
6625002266319		NTN	METER AMM	3.70E 4
6625002315295		NTN	METER ARB	3.70E 4
6625002410816		NTN	METER VLT	3.70E 4
6625002571103		NTN	METER MLT	3.70E 4
6625002648003		NTN	METER AMM	3.70E 4
6625002996316		NTN	METER AMM	1.41E 4
6625003098730		NTN	METER AMM	1.33E 4
6625003098731		NTN	METER AMM	3.70E 1
6625003330411		NTN	METER VLT	1.11E 4
6625003330412		NTN	METER AMM	5.55E 3
6625003359489		NTN	METER AMM	4.07E 4
6625003359512		NTN	METER ARB	1.70E 4
6625004056606		NTN	METER VLT	2.59E 3
6625004505495		NTN	METER VLT	3.70E 4

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
6625005004585		NTN	METER ARB	5.55E 3
6625005004589		NTN	METER ARB	5.55E 3
6625005101788		NTN	METER AMM	7.77E 2
6625005190072		NTN	METER ARB	1.70E 4
6625005192149		NTN	METER ARB	2.70E 4
6625005192805		NTN	METER AMM	9.25E 3
6625005234291	6625005733786	ANARM 22	METER VLT	8.88E 3
6625005238570		NTN	METER ARB	3.70E 5
6625005331709		NTN	METER ASM	3.70E 4
6625005331719		NTN	METER ARB	3.70E 4
6625005389000		NTN	METER AMM	1.15E 4
6625005389575		NTN	METER MLT	3.15E 4
6625005389700		NTN	METER AUD	3.70E 4
6625005398575		SG- 13/ARN		3.33E 5
6625005399577		NTN	METER AMM	3.70E 4
6625005409051	6625005809579	TS 559/FT	METER AMM	1.04E 4
6625005420574		NTN	METER VLT	3.70E 4
6625005421559		NTN	METER AMM	1.18E 4
6625005537625		NTN	METER AMM	3.33E 4
6625005538190		NTN	METER AMM	3.70E 1
6625005553092		NTN	METER AMM	l.llE 4
6625005553094		NTN	METER VLT	1.96E 4
6625005553095		NTN	METER VLT	2.04E 4
6625005554385		NTN	METER ARB	6.29E 3
6625005690243		NTN	METER AMM	2.18E 4
6625005733786		NTN	METER VLT	8.88E 3
6625005785612		NTN	METER AMM	2.33E 4
6625005801901		NTN	METER VLT	1.04E 4
6625005809579		NTN	METER AMM	1.04E 4
6625005812684		NTN	TIMER	3.70E 4
6625005855742		NTN	METER AMM	6.29E 3
6625005969258		NTN	METER AMM	5.29E 4
6625006182068		NTN	METER ARB	l.llE 3
6625006431498	6625006491633	TS 117	METER AMM	l.llE 4
6625006431670	5930006551514	ME-30A/U	T.S.	5.55E 3
6625006491633		NTN	METER AMM	l.llE 4
6625006685134		NTN	METER AMM	9.62E 3
6625006688145		NTN	METER VLT	1.15E 4
6625006689315		NTN	METER VLT	7.40E 3
6625006690261		NTN	METER MLT	2.29E 4
6625006690769		NTN	METER AUD	2.55E 4
6625006690770		NTN	METER AUD	1.48E 4
6625006824762		NTN	METER VLT	1.52E 4
6625007527530		NTN	METER VLT	3.70E 3
6625007527537		NTN	METER AMM	1.52E 4
6625007527960		NTN	METER ARB	8.14E 3
6625007528075		NTN	METER AMM	1.48E 4
6625007663357		NTN	METER AMM	2.52E 4

APPENDIX C
RA-226 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE NUMBER	PART NAME	ACTIVITY IN Bq
6625007726755		NTN	METER AUD	5.18E 3
6625007864136		MK 387		l.llE 4
6625008274651		NTN	METER AMM	3.70E 4
6625008309685		NTN	METER GAL	3.70E 4
6625008411788		NTN	METER AMM	1.18E 4
6625008426532		NTN	METER AMM	4.07E 3
6625008430971		SG-298/U		3.723 4
6625008476924		NTN	METER AMM	7.40E 3
6625008559447		ANARM 45		8.51E 4
6625008688124	6625006182068	ANPDR 6	METER AMM	l.llE 2
6625008688323	6625005554385	ANARM 63	METER ARB	6.29E 3
6625008706208		NTN	METER AMM	1.26E 4
6625008723214		NTN	METER ARB	3.70E 4
6625008751056		NTN	METER ARB	3.70E 4
6625008776436		NTN	METER AMM	3.70E 4
6625008849838		NTN	METER AMM	9.25E 3
6625008891585		NTN	METER AMM	9.62E 3
6625009012972	6610008398638	ANARC 54	INDICATOR	5.55E 4
6625009264412		NTN	METER AMM	3.70E 4
6625009618362		NTN	METER VLT	5.55E 3
6625009619551		NTN	METER AMM	5.55E 3
6625009715007		NTN	METER AMM	2.52E 4
6625009959536		NTN	METER AMM	5.55E 3
6665005431443	6665006841199	ANPDR 27G	SOURCE	2.59E 5
6665005615887	6665006841199	ANPDR 27	SOURCE	2.59E 5
6665005801793	6625008751056	IM108	METER RAD	3.70E 4
6665006469407		NTN	METER RAD	3.70E 4
6665007382128	5930006551582	M 4Al	SWITCH	5.55E 3
6665008568037	6665008751056	IM174	METER RAD	3.70E 4
6665008688124	6625006182068	ANPDR 6	METER ARB	l.llE 3
6665008751056		NTN	METER RAD	3.70E 4
6665008777932		NTN	METER RAD	6.29E 3
6665009995145	6665008777932	IM174A	METER F&D	6.29E 3
6740004704288	5930006551582	EN601	T.S.	5.55E 3
6780000186868		ES 38B		l.llE 4
6780002425756		ES 38Bl		l.llE 4
6780003565408	6645006637941	ANTFQ 7	TIMER	2.33E 5
6780004002641	6645006637941	ES 82A	TIMER	2.33E 5
6780005081175A	6645006637941	ANTFQ 7A	TIMER	2.33E 5
6780005081175B	6645006637941	ANTFQ 7B	TIMER	2.33E 5
6780005081178	6645006637941	ANTFQ 7	TIMER	2.33E 5
6780007596025		ES 38A 38A		l.llE 4
6780009265254		ES 38A		l.llE 4
7450009996085	6625005733786	ANTNH 16	METER VLT	8.88E 3
9905002523748		NTN	MARKER	1.48E 4

APPENDIX D

CECOM

THORIUM COMMODITY

NSN SEQUENCE TO TYPE NUMBER

CROSS REFERENCE

APPENDIX D
TH-232 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE	ARTICLE NUMBER	PART NAME	ACTIVITY IN Bq
5180006751180	6665005421587	NTN		RADIA SET	3.70E 2
5855000105162		NTN		LENS,40MM	1.50E 5
5855000105184		NTN		LENS,40MM	1.91E 5
5855000105187		NTN		LENS,40MM	1.29E 5
5855000105195		NTN		LENS,40MM	1.72E 5
5855000105196		NTN		LENS,40MM	1.81E 4
5855000512792		MX-7854		IMAGE ITS	1.81E 5
5855000533142		Mx-7901		SCOPE	6.59E 5
5855000544545		NTN		MODULE#2	6.03E 4
5855000544565		NTN		MODULE#2	6.11E 4
5855000544686		NTN		MODULE#2	6.03E 4
5855000548490		MX-8200		IMAGE ITS	8.88E 4
5855000548617		NTN		E.P.	3.74E 4
5855000548669		MX-7854		IMAGE ITS	1.81E 5
5855000551307		MX-8200		IMAGE ITS	8.88E 4
5855000576900		NTN		IMAGE ITS	8.88E 4
5855000872941		MX-8501		IMAGE ITS	1.81E 5
5855000872942		ANPVS 1			2.89E 5
5855000872947		ANPVS 2		IMAGE ITS	2.89E 5
5855000872948		MX-8501		IMAGE ITS	1.81E 5
5855000872974		ANPVS 1			2.89E 5
5855000873144		ANTVS 2			2.89E 5
5855001135680		MX-8201		SCOPE	8.88E 4
5855001472508		MX-7856A		IMAGE ITS	5.62E 5
5855001564992		ANPVS 3A			1.26E 5
5855001564993		MX-8201A		SCOPE	8.88E 4
5855001677636		MX-8239		IMAGE ITS	5.62E 5
5855001677887		NTN		LENS,18MM	9.62E 3
5855001677888		NTN		LENS,18MM	1.89E 4
5855001677890		NTN		LENS,18MM	8.88E 3
5855001773502		MX-8501A		IMAGE ITS	1.81E 5
5855001793708		ANPVS 2A			2.89E 5
5855001793709		MX-7833A		SCOPE	1.81E 5
5855001798200		NTN		MODULE#3	1.88E 5
5855001798202		NTN		MODULE#3	6.03E 4
5855001798203		NTN		MODULE#2	6.03E 4
5855001798204		NTN		MODULE#l	6.03E 4
5855004002621		NTN		LENS	1.08E 5
5855004013442		MX-7854A		IMAGE ITS	1.81E 5
5855004090915		MX-7794B		SCOPE	1.08E 5
5855004090920		NTN		E.P. 18MM	3.74E 4
5855004848638		ANTVS 2B			2.89E 5
5855006889954		Mx-7793		SCOPE	1.08E 5
5855006889956		ANTVS 4			1.22E 6
5855006889957		ANTVS 4			1.22E 6
5855007603869		ANPVS 2B		NV SIGHT	2.89E 5
5855007603870		ANTVS 4A			1.22E 6
5855007911628		NTN		LENS,25MM	5.00E 4
5855007911644		NTN		LENS	2.22E 4
5855007911653		MX-7794A		SCOPE	1.08E 5

APPENDIX D
TH-232 DEVICES
NATIONAL STOCK NUMERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE	ARTICLE NUMBER	PART NAME	ACTIVITY IN Bq
5855007913358		ANTVS	2A		2.89E 5
5855008327223		NTN		LENS	5.62E 5
5855008327284		MX-8239		IMAGE ITS	5.62E 5
5855008329223	5855009413037	MX-7833		NV SIGHT	1.81E 5
5855008329341		ANPVS	3		1.26E 5
5855008790546		40 MMEP		E.P.	6.59E 5
5855009060994		ANTVS	4		1.22E 6
5855009089314		MX-7856		IMAGE ITS	5.62E 5
5855009111370		ANTVS	2		2.89E 5
5855009309478		NTN		E.P.	6.59E 5
5855009333248		40 MMEP		E.P.	6.59E 5
5855009335829		MX-7855		IMAGE ITS	1.81E 5
5855009371661		Mx-7794		SCOPE	1.81E 5
5855009413037		25 MM		E.P.	1.08E 5
5855009623069		NTN		LENS	3.63E 4
5855010308595		DT 591 /UA		DET DWR	3.70E 1
5855010308601		SU 97/UA		OPTL IMGR	3.70E 2
5855010586687		SUl03/UA		OPTL IMGR	7.40E 2
5855010608521		ANVSG	2		5.55E 3
5855010616751		DT 594 /UA		DET DWR	7.40E 1
5855010623115		NTN		AFCL ASSY	7.40E 3
5855010623116		NTN		LENS	1.48E 3
5855010623117		NTN		LENS	1.48E 3
5855010623121		NTN		LENS	l.llE 2
5855010623124		NTN		LENS	1.48E 2
5855010623126	5855010616751	NTN		DET DWR	7.40E 1
5855010631347		NTN		WINDOW	1.85E 3
5855010823685		NTN		OPTL IMGR	1.07E 3
5855010823685A		SUl2l/UA		OPTL IMGR	1.07E 3
5855011091807		DT 617 /UA		DET DWR	7.40E 1
5855011346733	5855011091807	NTN		DET DWR	7.40E 1
5855011729992		DT 591A/UA		DET DWR	3.70E 1
5855012100503		DT 617A/UA		DET DWR	7.40E 1
5855012911126				DET DWR	7.40E 1
5865010764101		NTN		WINDOW	2.96E 2
5865010764102		NTN		MODULATOR	2.96E 2
5865010776320	5865010764102	ANALQ147A	V1	MODULATOR	2.96E 2
5865010776321	5865010764101	ANALQ147A	V2	WINDOW	2.96E 2
5985012795321		DT616/ANVDR2		PROBE WV	3.70E 1
6260001700430		NTN		LANTERN	1.55E 2
6260002704060		NTN		LANTERN	1.55E 2
6665002118695		ANPDR	56F	SOURCE	8.70E 3
6665005421587		ANPDR	60	RADIA SET	4.44E 4
6665008029126		CR	12	SOURCE	3.70E 2
6665009651516		ANPDR	60	RADIA SET	7.40E 2
6665011139530		ANPDR	56F	SOURCE	8.70E 3
6665012221425		ANVDR	2	RADIA SET	3.70E 1

APPENDIX D
TH-232 DEVICES
NATIONAL STOCK NUMBERS (NSN) IN NSN SEQUENCE
CROSS REFERENCED TO TYPE NUMBER

END ARTICLE NSN	PART NSN	END ARTICLE TYPE	ARTICLE NUMBER	PART NAME	ACTIVITY IN Bq
6760007535152	6760008638661	KA-30A		LENS CONE	1.04E 4
6760008638661		LA-131Al		LENS CONE	1.04E 4
6720006644007	6760008638661	KE-4		LENS CONE	1.04E 4
6760000873737		LA-372A		LENS CONE	1.04E 4

APPENDIX E

ABBREVIATIONS

AND

DEFINITIONS

Appendix E

ABBREVIATIONS

Bq	Becquerels (disintegrations per second)
CECOM	Communications - Electronics Command
CFR	Code of Federal Regulations
Ci	Curie (3.70E10 disintegrations per second)
dps	Disintegrations per second
DOT	Department of Transportation
IAEA	International Atomic Energy Agency
IAW	In accordance with
MDA	Minimum Detectable Activities
n.o.s.	Not Otherwise Specified
NRC	U.S. Nuclear Regulatory Commission
NSN	National Stock Number
NVD	Night Vision Devices
RADIAC	Radiation, detection, indication and computation
RAM	Radioactive Material
RSO	Radiation Safety Officer
T.I.	Transport Index
TBq	Terabecquerels (101^2 Becquerels)
USPS	U.S. Postal Service

DEFINITIONS

1. Contamination Wipe Survey - A survey for non-fixed (removable) radioactive contamination on surfaces. This is accomplished by wiping a portion of all surfaces of the package with absorbent material to determine the presence of radiological contamination.

*NOTE: Results of the package wipe test must be obtained PRIOR TO SHIPMENT.

Analysis of the wipes can be obtained from the U.S. Army Communications-Electronics Command, the U.S. Army Ionizing Radiation Dosimetry Center or a facility possessing a proportional counter, liquid scintillation counter or other detector (not survey instrument) capable of detecting the contamination levels in 49 CFR 173.443. Detectors having Minimum Detectable Activities (MDA) of 3.0 E-04 µCi or lower (alpha, beta emitters) will satisfy the minimum requirements of 49 CFR 173.443. Package wipe tests for CECOM managed radioactive commodities may be mailed to this command for analysis. Our address is: Commander, USACECOM, ATTN: AMSEL-SF-RE(Lab), Bldg 2539, Fort Monmouth, NJ 07703-5024.

2. Instruments and Articles - See " Radioactive instrument and article"

3. Limited Ouantity of Class 7 (Radioactive) Material - A quantity of Class 7 (radioactive) material not exceeding the materials package limits specified in 49 CFR Part 173.425 and conforming with requirements specified in 49 CFR Part 173.421.

4. Material Movement and Supply Documentation - Forms required for all shipments IAW applicable Army and DoD regulations. All shipments of instruments or calibrators to depots must include documentation describing the purpose of the shipment (e.g., calibration and return, turn-in for depot stock, etc.).

5. Non-Fixed Radioactive Contamination - Radioactive contamination that can be readily removed from a surface by wiping with an absorbent material.

6. Normal Form Radioactive Material - Radioactive material which has not been demonstrated to qualify as" Special Form Radioactive Material."

7. Package - For radioactive materials, the packaging together with its radioactive contents as presented for transport.

8. Packaging - For radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of 49 CFR 173.24 and 173.410 through 173.419. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

9. Radiation Level - The radiation dose equivalent rate expressed in millirem per hour (mrem/hr).

10. Radiation Survev - This consists of measurements taken with an appropriate RADIAC instrument to ensure that the radiation level at the surface of a package meets the requirements of 49 CFR 173.441. A radiation survey is performed on certain incoming and all outgoing shipments of items containing radioactive materials.

11. Radioactive Instrument and Article - Any manufactured instrument and article such as an instrument, clock, electronic tube or apparatus, or similar instrument and article having

Class 7 (radioactive) material in gaseous or non-dispersible solid form as a component part.

12. Radioactive Contents - The radioactive material, together with any contaminated liquids or gases, within the package.

13. Radioactive Material - Any material having a specific activity greater than 0.002 microcuries per gram (µCi/g) or 74 Becquerels per gram (Bq/g) (See definition of " Specific Activity") .

14. Special Form Radioactive Material - Radioactive material which satisfies the following conditions:

a. It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;

b. The piece or capsule has at least one dimension not less than 5 millimeters (0.197 inch); and

C. It satisfies the test requirements of 49 CFR 173.469.

15. Specific Activity - Specific Activity of a radionuclide is the activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

16. Transport Index (T-I.) - A dimensionless number representing the maximum radiation level in mrem/hr at 1 meter, as measured from the surfaces of the shipping container rounded up to the nearest tenth (i.e., 0.13 mrem/hr at 1 meter equals a T.I. of 0.2). If the radiation reading is in millisieverts per hour (mSv/hr), the T.I. is the reading in mSv/hr multiplied by 100 and raised to the nearest tenth.

17. Type A Package - Type A packaging together with its limited radioactive contents. A Type A package does not require NRC Competent Authority Certificate of Approval since its contents are limited to A, or A, values.

18. Type B Package - Type B packaging together with its radioactive contents.

19. Type A Packaging - Packaging which is designed IAW with the general packaging requirements of 49 CFR Parts 173.24 and 173.412, and which is adequate to prevent the loss or dispersal

of the radioactive contents and retain the efficiency of its radiation shielding properties if the package is subject to the tests prescribed in 49 CFR 173.465.

20. Type B Packaging - Packaging which meets the standard for Type A packaging and, in addition, meets the standards for the hypothetical accident conditions of transport as prescribed in 10 CFR Part 71.

APPENDIX F

TABLE OF COMMON RADIOACTIVE COMMODITY ISOTOPES, USES, CHARACTERISTIC RADIATION AND DETECTION METHODS

TABLE OF TYPE A PACKAGE LIMIT AND EXCEPTED QUANTITIES AND ARTICLES ACTIVITY LIMITS FOR COMMON ISOTOPES IN MILITARY COMMODITIES

SAMPLE RADIOACTIVE MATERIAL MOVEMENT FORM

SAMPLE WIPE TEST ANALYSIS REQUEST FORM

Table of Common Radioactive Commodity Isotopes, Uses, Characteristic Radiation, and Detection Methods

Radioactive Isotope	General Uses	Radiation emitted, energy level (MeV) and half life	Contamination detection methods
Tritium, H,T, H3	Meter faces. dials, compasses, watches, collimator, telescopes, fire control devices, rifle sights, radio-luminous devices.	beta, 0.006 MeV (very) weak 12,33 year	survey meters. Perform wipe tests using metricel filter for swipe. Dampen filter with a few drops of demin water before use. Wipes can only be counted in a Liquid Scintillation Counting system.
Proemthium,147Pm, PM147	Rifle sights, radio-luminous devices	gamma, 0.121 Mev beta, 0.062 MeV 2.64 years	*G-M tube (AN/VDR 2) or equivalent. Swipe with NUCON wipes and count on low background alpha -beta system.
Radium 226 Ra, RA226	Toggle swithches, knobs, meters, watches, compasses luminous paint.	gamma, 0.186 MeV alpha, 4.780 MeV 1602 years	*G-M tube (AN/VDR 2) or equivalent, Swipe with UNCON wipes and count on low background alpha -beta system.
Depleted Uranium, 238U, DU	Munmans, armor, radiation shields, aircraft counter weights.	alpha, 4.20 MeV (weak x-ray and beta from daughters) 6,5 x 1015 years	Alpha detector, fidler (low energy x-ray detector), "Pancake" G-M tube Swipe with NUCON wipes and count in low background alpha - beta system
Thorium, 232 Th, TH232	Lens, engine parts, ignition exciters, night vision sights.	alpha, 4.01 MeV (weak x-ray and beta from daughters) $1.4x10^{10}$years	Alpha detector, fidler /low energy x-ray detector), "Pancake" G-M tube. Swipe with NUCON wipes and count in low background alpha - beta system. (Night vision systems only require wipes for

Table of Common Radioactive Commodity Isotopes, Uses, Characteristic Radiation, and Detection Methods

Radioactive Isotope	General Uses	Radiation emitted, energy level (MeV) and half life	Contaimination detection methods
Cobalt, ^{60}Co, CO60	Calibration source (gamma) UDM-1, for gamma radiation drtectors	gamma, 1.173 & 1.332 MeV beta,0.314 Mev 5.26 years	*G-M tube (AN/VDR2)or equivalent will detect. Swipe with NUCON wipes and count on low background alpha- beta system.
Cesium, ^{137} Cs, CS137	Calibration source (gamma) UDM-1A gamma radiation detectors, Moisture Density tester (MC-1).	gamma,)661 Mev beta, 0.541 Mev 30 years	*G-M tube (AN/VDR 2) or equialent will detect. Swipe with NUCON Wipes and count on low background alpha-beta system
Plutonium, ^{239} Pu, PU239	Calibration sources (alpha)UDM-6, for alpha radiation detectors	alpha, 5.16 MeV 24,390 year	Alpha detector, AN/PDR 77 OR Equivalent. Wipe NUCON wipe and count and low background alpha-beta system or use alpha survey instrument.
Americium AM241	Moisture Density Tester (MC-1), Chemical agent detector, M43A1,	alpha, 5.49 Mev 458 years	Alpha detector, AN/PDR 77 OR EQUIVALENT. Wipe with NUCON wipe and count in low background alpha-beta system or use alpha survey instrument.
Nickel, ^{63} Ni, Nl63	Chemical Agent Mointor (CAM).	beta, 0.067 Mev 92 year	**NOTE** **Low energy makes detection difficult.** *G-M tube (AN/VDR2) will not detect. A thin window "pancake" probe is best. Swipe with NUCOM wipe and count on low background alpha -beta system

Table of Common Radioactive Commodity Isotopes, Uses, Characteristic Radiation, and Detection Methods

Radioactive Isotope	General Uses	Radiation emitted, energy level (Mev) and halt lite	Contamination detection methods
Strontium, ^{90} Sr, SR90	Calibration source, UDM-2, for gamma radiation detectors	beta 5,46 Mev (2.27 Mev ^{90}Y) 28 years	*G-M tube (AN/VDR 2) or equivalent will detect. Wipe with NUCON wipe and Count on low background alpha- beta system.
Krypton, ^{85} Kr, KR85	Radiation check source	gamma, 0.514 MeV beta, 0.67 MeV 10.76 years	G-M tube (AN/VDR2) or equivalent will detect. KR85 is a noble gas and it will not contaminate surfaces, A leaking source will dissipate in the atmosphere.

*Contamination surveys are performed with beta shield open and detector "thin window" approximately 0.25 to 0.5 inches from surface being surveyed.

Type A package limit and limited quantities and articles activity limits for common isotopes in military commodities.

NOTE: verify values & requirements in 49 CFR 173, Subpart I				
Radioactive isotope	A_1 special form TBq (Ci)	A_2 normal form TBq (Ci)	Table 7- table of activity limits - excepted quantities and articles TBq (Ci)	United States Postal Service MAILABLE RADIOACTIVE MATERIALS TBq (Ci)
Tritium, ^{3}H, T of H-3	40 (1080)	40 (1080)	Tritium I&A: 0.8 (21.6) Package limit: 8 (216) Material package limit: 0.8 (21.6)	Tritium I&A: 0.08 (2.16) Package limit: 0.8 (21.6) Material package limit: 0.08 (2.16)
Promethium ^{147}Pm, Pm 147 Isotope Tritium, ^{3}H, T, or H-3	40 (1080)	0.9 (24.3)	Special Form I&A: 0.4 (10.8) Package limit: 40 (1080) Material package limit: 0.04 (1.08) Normal Form I&A: 0.009 (0.243) Package limit: 0.9 (24.3) Material package limit: 9E-04 (0.024)	Special Form I&A: 0.04 (1.08) Package limit: 4.0 (108) Material package limit: 0.004 (0.108) Normal Form I&A: 0.0009 (0.024) Package limit: 0.09 (2.43) Material package limit: 9E-05 (0.0024)
Radium, ^{226}RA Ra226	0.3 (8.11)	0.02 (0.541)	Special Form I&A: 0.003 (0.081) Package limit: 0.3 (8.11) Material package limit: 3E-04 (0.0081) Normal Form I&A: 2E-04 (0.0054) Package limit: 0.02 (0.54) Material package limit: 2E-05 (5.4E-04)	Special Form I&A: 3E-04 (0.008) Package limit: 0.03 (0.81) Material package limit: 3E-05 (8.1E-04) Normal Form &A: 2E-05 (5.4E-04) Package limit: 0.002 (0.054) Material package limit: 2E (5.4E-05)

Note: TBq = 1.0E12 Bq, and TBq = 27. Ci
1 Ci = 3.7E10 Bq or 0.037 Tbq

Type A package limit and excepted quantities and articles activity limits for common isotopes in military commodities.

Radioactive Isotope	A_1 Special form TBq (Ci)	A_2 normal form TBq (Ci)	Table 7 table of activity limits-excepted quantities and articles TBq(Ci)	States Postal Service MAILABLE RADIOACTIVE MATERIALS TBq(Ci)
Depleted DU Uranium,	unlimited	unlimited	Reference 49 CFR 173.426, 173.421(3)(4)(5) and 173.422	Reference 49 CFR 173.426, 173.421(3)4)(5) and 173.422
Thorium, 232Th, Th2323	unlimited	unlimited	Reference 49 CFR 173.424, 173.421(3)(4)(5) and 173.422	Reference 49 CFR 173.424, 173.421(3)(4)(5) and 173.422
Cobalt, 60Co, Co60	0.4(10.8)	0.4(10.8)	Special Form I&A: 4E-03 (0.1) Package limit: 0.4 (10.8) Material package limit: 4E-04 (0.01) Normal Form I&A:4E-03(0.1) Package limit: 0.4(10.8) Material Package limit: 4E-04(0.01)	Special Form I&A: 4E-04 (0.01) Package limit: 0.04(1.08) Material package limit:4E-05 (0.001) Normal Form I&A: 4E-04 (0.01) Package limit: 0.04(1.08) Material package limit:4E-05 (0.001)
Cesium, 137 Cs, Cs137	2 (54.1)	0.5(13.5)	Special Form I&A:0.02 (0.54) Package limit: 2 (54.1) Materail package limit:0.002(0.054) Normal Form I&A:0.005 (0.13) Package limit: 0.5(13.5) Material package limit:5E-04(0.013)	Special Form I&A: 0.002(0.054) Package limit: 0.2(5.41) Material package limit:2E-04(5.4E-03) Normal Form I&A: 5E-04 (0.013) Package limit: 0.05(1.35) Material package limit:5E-05(1.3E-03)
Plutonium, 239Pu, Pu239	2 (54.1)	2E-04(5.41E-03)	Special Form I&A: 0.02(0.541) Package limit: 2(54.1) Material package limit:2E-03(0.054) Normal Form I&A: 2E-06(5.41E-05) Package limit: 2E-04(5.41E-03) Material package limit: 2E-07 (5.41E-06)	Special Form I&A:0.002(0.054) Package limit: 0.2(5.41) Material package limit: 2E-04(0.0054) Normal Form I&A: 2E-07(5.41E-06) Package limit: 2E-05(5.41E-04) Material package limit: 2E-08(5.41E-07)

Type A package limit and excepted quantities and articles activity limits for common isotopes in military commodities.

Radioactive Isotope	A_1 special form TBq (Ci)	A_2 normal form Tbq (Ci)	Table 7 table of activity limits-excepted quantities and articles TBq (Ci)	United States Postal Service MAILABLE RADIOACTIVE MATERIALS TBq (Ci)
Americium, 24^1Am, Am241	2 (54.1)	2E-04(5.4lE-03)	Special Form I&A: 0.02 (0.541) Package limit: 2 54.1) Material package limit: 2E-03(0.054) Normal Form I&A: 2E-06(5.4lE-05) Package limit: 2E-04(5.41E-03) Material package limit: 2E-07(5.41E-06)	Special Form I&A: 0.002 (0.054) Package limit: 0.2(5.41) Material package limit: 2E-04(5.4E-03) Normal Form I&A: 2E-07(5.41E-06) Package limit: 2E-05(5.4lE-04) Material package limit: 2E-08(5.4lE-07)
Nickel, ^{63}Ni. Ni63	40 (1080)	30(811)	Special Form I&A: 0.4(10.8) Package limit: 40 (1080) Material package limit: 0.04 (1) Normal Form I&A: 0.3(18.1) Package limit: 30 (811) Material package limit:0.03(0.81)	Special Form, I&A: 0.04 (1.08) Package limit: 4 (108) Material package limit:0.004(0.1) Normal Form, I&A: 0.03(10.81) Package limit: 3 (81.1) Material package limit:0.003(0.081)
Strontium, ^{90}Sr, Sr90	0.2 (5.41)	0.1(2.7)	Special Form I&A: 0.002 (0.0541 Package limit: 0.2 (5.41) Material package limit:2E-04(0.0054) Normal Form I&A: 1E-03 (2.7E-021 Package limit: 0.1(2.7) Material package limit: lE-04 (2.7E-03)	Special Form I&A: 2E-04 (0.0054) Package limit: 0.02 (0.541) Material package limit:2E-05(.0005) Normal Form I&A: lE-04(2.7E-03) Package limit: 0.01 (0.27) Materialpackage limit: 1E-05 (2.7E-04)

Type A package limit and excepted quantities and articles activity limits for common isotope in military commodities.

Radioactive Isotope	A_1 special form TBq (Ci)	A_2 normal form TBq (Ci)	Table 7 table of activity limits-excepted quantities and articles TBq (Ci)	United States Postal Service MAILABLE RADIOACTIVE MATERIALS TBq (Ci)
Krypton, ^{85}Kr Kr85	20(541)	10 (270)	Gases: Special form I&A:0.02 (541) Package limit: 0.2 (5.41) Material package limit:0.02(0.54) Gases: Normal Form I&A: 0.01 (0.271 Package limit: 0.1 (2.7) Material package limit: 0.01 (0.27)	Gases: Special Form I&A: 0.002 (0.054) Package limit: 0.02(0.54) Material package limit:0.002 (0.054) Gases: Normal Form I&A: 0.001 (0.027) Package limit: 0.01(0.27) Material package limit:0.001(0.027)

A_1 quantity of an isotope in "special form" that can be shipped in a package certified to meet type A, class 7, package requirements. 'Special form" radioactive items must have a certification that they have passed the DOT tests. Without certification documentation radioactive items are "normal form".

A_2 quantity of an isotope in "normal form" that can be shipped in a package certified to meet type A, class 7, package requirements. The majority of military radioactive commodities are "normal form".

Table 7. Instruments and articles, item, maximum activity and package activity limit for shipments of limited quantities of radioactive materials. Quantities of isotopes in configurations other than instruments and articles package activity limit.

United States Postal Service ---- Publication 6, May 1989, limits mailable radioactive activitv to 10% of the 49 CFR 173.423, table 7 values. All other 49 CFR conditions applicable to limited quantity packages apply.

RADIOACTIVE MATERIAL MOVEMENT FORM

CHECK ONE: _____ SHIPMENT _____ RECEIPT	MOVEMENT NUMBER:_____
From:	To:

COMMODITY DESCRIPTION

Number of Containers	QTY	NSN	Nomenclature	Isotope	Activity	Total Activity

MODE OF SHIPMENT	PHYSICAL CHARACTERISTICS	RADIATION SURVEY RESULTS
_____ Air _____ Truck _____ Rail _____ Water _____ Parcel Post _____ Other	_____ Special Form _____ Normal Form _____ Solid _____ Liquid _____ Gas	Instrument Used:_____ Calibration Due:_____SN:_____ Transport Index:_____ *Surface*:_____mrad/hr _____µGy/hr One Meter: _____ mrad/hr _____µGy/hr Background:_____mrad/hr _____µGy/hr

WIPE TEST RESULTS

Wipe	Sample	
Taken by:_____ Date:_____	Counted by:_____ Date:_____	Removable: _____ dpm/100 cm^2 LLD: _____ µCi_____ Bq

BASIC DESCRIPTION

_____ Radioactive Material, Excepted Package - Instruments & Articles, 7, UN 2910

_____ Radioactive Material, Excepted Package - Limited Quantity of Material, 7, UN2910

_____ Radioactive Material, Excepted Package - Articles Manufactured from Natural or Depleted Uranium or Thorium, 7, UN 2910

_____ Radioactive Material, *Special Form*, n.o.s., 7, UN 2974

_____ Radioactive Material, Low Specific Activity LSA, n.o.s., 7, UN 2912

_____ Radioactive Material, Fissile, n.o.s., 7, UN 2918

_____ Radioactive Material, Excepted Package - Empty Packaging, 7, UN 2910

Labeling	Marking	Shipping Papers
_____ White I _____ Yellow II _____ Yellow III _____ Exempt	_____ Radioactive _____ Radioactive LSA _____ Waste Class A, B, C _____ Other (_____) _____ Exempt	_____ Included & Complete _____ Exempt

24 HOUR EMERGENCY RESPONSE PHONE NUMBER ( )
COMMENTS:

Printed Name of RPO or Designee:	Signature:	Date:

WIPE TEST ANALYSIS REQUEST FORM

(Instructions On Reverse Side)

(1) FROM:

(2) TO: Commander, U.S. Army CECOM
ATTN: AMSEL-SF-RE(Lab) B. 2539
Fort Monmouth, NJ 07703-5024

(3) SAMPLE #	(4) DESCRIPTION OF WIPE	(5) ISOTOPE	RESULTS(µCi) DPM
1.			
2.			
3.			
4.			
5.			

(6) WIPE TAKEN BY/DATE:

(7) PHONE: DSN: Commercial: ( )

(8) COMMENTS:

********** **FOR USE BY DIRECTORATE OF SAFETY RISK MANAGEMENT**********

1. Reference FONECON between this Directorate and your organization,

2. The above results are below the contamination limits as specified in AR 385-11, Table 4-3, Ionizing Radiation Protection, 1 May 1980.

3. If you require further assistance, contact us at DSN: 987-2667; Commercial: (732) 427-2667; FAX: Comm: (732) 427-2667; DSN: 987-2667.

4. The estimated lower limit of detection (LLD) for is

JOSEPH M. SANTARSIERO
Chief, Radiological
Engineering Division

Instructions for Completing the WIPE TEST ANALYSIS REQUEST FORM

(1) **FROM:** Your mailing address (where CECOM Directorate of Safety Risk Management sends the analysis results).

(2) **TO:** CECOM Directorate of Safety Risk Management mailing address (where you send the samples for analysis).

(3) **SAMPLE #:** Print this sample number on the corresponding wipe submitted for analysis.

(4) **DESCRIPTION OF WIPE:** Brief description of what you wiped, i.e., package, commodity (NSN), storage area survey wipe, locker, floor, shelf, etc.

(5) **ISOTOPE(S):** List the radioactive isotope you want the wipe analyzed for, i.e., Tritium (H3), Radium-226 (Ra226), Strontim-90 (Sr90), etc.

(6) **WIPE TAKEN BY/DATE:** Person who performed wipe test and date.

(7) **PHONE:** Your DSN and Commercial Numbers (Fax number, if necessary).

(8) **COMMENTS:** Use this block to communicate with us. You can request more NuCon or Metricel wipes, indicate administrative changes, or just give us more information about your request for analysis.

NuCon Wipe or Metricel Filter Which to Use and When?

NuCon Wipe: A 1.75 inch, cloth disk with an adhesive back. The NuCon wipe is used to detect removable gross alpha/beta particles. It can be used to wipe packages, work surfaces, shelves, and perform leak test where the isotope is anything **other than H3 or Nickel-63 (Ni63),** i.e., Ra226, Sr90, Pu239, Am241, etc.

Metricel Filter: A 1.5 inch, **WHITE** (NOT BLUE) nitrocellulose membrane filter. It is used to collect **H3, Ni63 and other low energy beta emitting particles. ONLY** a metricel filter shall be used to wipe for these isotopes.

APPENDIX G

ACTIVITY CONVERSIONS

CONVERSION CHART

IF YOU HAVE:		TO OBTAIN:
CURIE	**MULTIPLY BY:**	**BECQUEREL**
Curie (Ci)	3.70 E10	Becquerel (Bq)
millicurie (mCi)	3.70 E07	Bq
microcurie (µCi)	3.70 E04	Bq

Example:

2.2 Cix 3.70 E10 = 8.14 E10Bq

180 mCi x 3.70 E07 = 6.66 E09 Bq

10 µCi x 3.70 E04 = 3.70 E05 Bq

IF YOU HAVE:		TO OBTAIN:
BECQUEREL	**DIVIDE BY:**	**CURIE**
Bq	3.70 E10	Ci
Bq	3.70 E07	mCi
Bq	3.70 E04	µCi

Example:

2.22 E10 Bq ÷ 3.70 E10 = 0.60 Ci

2.22 E10 Bq ÷ 3.70 E07 = 6.00 E02 mCi

2.22 E04 Bq ÷ 3.70 E04 = 0.60 µCi

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, *United States Army*
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army

DISTRIBUTION:

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION

THEN ... JOT DOWN THE INFO ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL.

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703-5007

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 20 IFF antenna lag rather than 10. REASON: Experience has shown that with only a 10 lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing stress to the drive train. Hunting is minimized by adjusting the lag to 20 without degradation of operation.
3-10	3-3		3-1	Item 5, Functional Description. Change •2 dB" to •3 dB". REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 dB (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, •Replace cover plate removed in step e above." REASON: To replace the cover plate.
		FO-3		Zone C 3. On J1-2, change •+24 VDC" to •+5 VDC". REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE

P.S. - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 072563-000