

**TRANSPORTATION REQUIREMENTS FOR TACOM-RI  
RADIOACTIVE COMMODITIES  
(on public highway/roads)**

1. Purpose and Scope. This following information provides a basic reference for personnel who prepare for shipment and/or transport U.S. ARMY, TACOM-RI managed radioactive commodities. It summarizes the basic regulatory packaging and shipping requirements for U.S. ARMY, TACOM-RI radioactive commodities to ensure that their transport complies with applicable Department of the Army (DA) and Federal Regulations. The information contained herein complies with Title 49, Code of Federal Regulations (49 CFR), 10 CFR Part 71, and Army Regulation (AR) 11-9 for the shipment of U.S. ARMY, TACOM-RI managed radioactive commodities. For modes of shipment other than ground, please contact your Radiation Safety Officer and/or Transportation Officer for the latest guidance. This information is not applicable for mixtures of radioisotopes, for radioactive waste shipments, and Depleted Uranium munitions/armor (consult 49 CFR, 10 CFR 71 and AR 11-9). In addition, if you are stationed OCONUS, you must comply with host nation regulations.
  
2. General. All of TACOM-RI managed radioactive commodities are classified as Instruments or Articles and can be shipped as an “Excepted Package”.
  
3. The definition of “Excepted Packages for Radioactive Instruments and Articles” are found in 49 CFR, 173.424. This part and section states “ A radioactive instrument or article and its packaging is **excepted** (not needed) from the **specification packaging, shipping paper and certification, marking and labeling** requirements of this subchapter and requirements of this subpart, **if**: all of 173.424(a) through 173.424(h) are **MET**.
  
4. The following pages will provide you for shipping/transport of specific TACOM-RI managed radioactive commodities.

**\*\*\*\*\*NOTE\*\*\*\*\***

**It is the shipper’s responsibility to ensure that he/she is using the latest shipping instructions. If you are in doubt, contact the proper authorities prior to preparing a package for shipment to ensure compliance.**

**M22 AUTOMATIC CHEMICAL AGENT ALARM (ACADA)**  
**NSN 6665-01-438-6963**

**Isotope and Activity:** Ni-63, 1.11E+09 Bq (30 mCi maximum activity) (The activity may be 7.4E+08 Bq (20 mCi), if marked as such).

**Proper Shipping Name/Hazard Class/UN Number:**

Radioactive material, excepted package - instruments/7/UN2910. Not needed

**Chemical and/or Physical Form and Construction Form:** Ni-63 foil, solid, normal

**Package Requirements:**

173.424(a)—“Each package meets the General Design Requirements of 49 CFR 173.410”. A card board box, wooden box, tri-haul box will suffice as long as it is serviceable.

173.424(b)—“The activity of the instruments or articles does not exceed the relevant limit listed in Table 7 in 173.425”. A single M22 ACADA does not exceed this limit.

173.424(c)—“The total activity per package does not exceed the relevant limit listed in Table 7 in 173.425”. Your unit does not have enough M22 ACADAs to exceed this limit, however when packaging multiple devices, into one package, weight, handling, and other requirements may apply as per 49 CFR 173.410.

173.424(d)—“The radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article does not exceed 0.1 mSv/hour (10 mrem/hour)”. You must use an actively calibrated radiacmeter. NOTE: Ni-63 can only be detected with the use of currently fielded AN/VDR-2 and AN/PDR-77. If beta is detected, the item would not be shipped, bag, tag and contact your RSO for further guidance.

173.424(e)—“The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour)”. Same as 173.424(d).

173.424(f)—“The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in 173.443(a)”. This requires that a wipe test of 300 square centimeters of the surface concerned, and that the removable contamination cannot exceed Table 11, in 173.443. Analysis results are required prior to shipment. The non-fixed (removable) radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm<sup>2</sup> (beta). The U.S. Army is exempt from performing this wipe test if a NEW BOX (cardboard, plastic, wood, etc) is used in the shipment of the device.

173.424(g)—“Except as provided in 173.426, the package does not contain more than 15 grams of uranium-235; and”..(173.424(g) does not pertain to TACOM-RI Commodities)

173.424(h)—“The package is otherwise prepared for shipment as specified in 173.422”.

**173.422 Additional requirements – Certification Statement:** You shall 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. The statement of conformity must be verbatim as per 173.422 and this notice must include the name of the consignor or consignee.

### **CERTIFICATION 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 30 TBq (810.8 Ci) total activity for Ni-63 that you may ship per package.

**CHEMICAL AGENT MONITOR NSN 6665-01-199-4153**  
**IMPROVED CHEMICAL AGENT MONITOR NSN 6665-01-357-8502**

**Isotope and Activity:** Ni-63, 5.55E+08 Bq (15 mCi maximum activity) (The activity may be 3.7E+08 Bq (10 mCi), if marked as such.).

**Proper Shipping Name/Hazard Class/UN Number:**

Radioactive material, excepted package - instruments/7/UN2910.

**Chemical, Physical Form, Construction Form:** Plated Ni-63, solid and Normal.

**Package Requirements:**

173.424(a)—“Each package meets the General Design Requirements of 49 CFR 173.410”. A card board box, wooded box, tri-haul box will suffice as long as it is serviceable.

173.424(b)—“The activity of the instruments or articles does not exceed the relevant limit listed in Table 7 in 173.425”. A single CAM/ICAM does not exceed this limit.

173.424(c)—“ The total activity per package does not exceed the relevant limit listed in Table 7 in 173.425”. Your unit does not have enough CAMS/ICAMS to exceed this limit, however when packaging multiple devices, into one package, weight, handling, and other requirements may apply as per 49 CFR 173.410.

173.424(d)—“The radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article does not exceed 0.1 mSv/hour (10 mrem/hour)”. You must use an actively calibrated radiacmeter. NOTE: Ni-63 can only be detected with the use of currently fielded AN/VDR-2 and AN/PDR-77. If beta is detected, the item would not be shipped, bag, tag and contact your RSO for further guidance.

173.424(e)—“The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour)”. Same as 173.424(d).

173.424(f)—“ The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in 173.443(a)”. This requires that a wipe test of 300 square centimeters of the surface concerned, and that the removable contamination cannot exceed Table 11, in 173.443. Analysis results are required prior to shipment. The non-fixed (removable) radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm<sup>2</sup> (beta). The U.S. Army is exempt from performing this wipe test if a NEW BOX (cardboard, plastic, wood, etc) is used in the shipment of the device.

173.424(g)—“Except as provided in 173.426, the package does not contain more than 15 grams of uranium-235; and” (173.424(g) does not pertain to TACOM-RI Commodities)

173.424(h)—“The package is otherwise prepared for shipment as specified in 173.422”.

**173.422 Additional requirements – Certification Statement:** You shall 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. The statement of conformity must be verbatim as per 173.422 and this notice must include the name of the consignor or consignee.

#### **CERTIFICATION 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 30 TBq (810.8 Ci) total activity for Ni-63 that you may ship per package.

## **M43A1 AUTOMATIC CHEMICAL AGENT DETECTOR NSN 6665-01-081-8140**

**Isotope and Activity:** Am-241, 9.25 E+06 Bq (250  $\mu$ Ci).

**Proper Shipping Name/Hazard Class/UN Number:**

Radioactive material, excepted package - instruments/7/UN2910.

**Chemical, Physical Form and Construction Form :** Americium oxide, solid & special.

### **Package Requirements:**

173.424(a)—“Each package meets the General Design Requirements of 49 CFR 173.410”. A card board box, wooded box, tri-haul box will suffice as long as it is serviceable.

173.424(b)—“The activity of the instruments or articles does not exceed the relevant limit listed in Table 7 in 173.425”. A single M43A1 does not exceed this limit.

173.424(c)—“The total activity per package does not exceed the relevant limit listed in Table 7 in 173.425”. Your unit does not have enough M43A1 to exceed this limit, however when packaging multiple devices, into one package, weight, handling, and other requirements may apply as per 49 CFR 173.410.

173.424(d)—“The radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article does not exceed 0.1 mSv/hour (10 mrem/hour)”. Am-241, is primary a alpha emitter, but it has an associated gamma energy, the currently fielded AN/VDR-2 and/or AN/PDR-77 will measure this gamma energy.

173.424(e)—“The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour)”. Same as 173.424(d). NOTE: When packaging multiple devices into one package it will be possible to exceed this maximum external surface limit.

173.424(f)—“The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in 173.443(a)”. This requires that a wipe test of 300 square centimeters of the surface concerned, and that the removable contamination cannot exceed Table 11, in 173.443. Analysis results are required prior to shipment. The non-fixed (removable) radioactive contamination on the external surfaces of the package shall not exceed 2.2 dpm/cm<sup>2</sup> (alpha). The U.S. Army is exempt from performing this wipe test if a NEW BOX (cardboard, plastic, wood, etc) is used in the shipment of the device.

173.424(g)—“Except as provided in 173.426, the package does not contain more than 15 grams of uranium-235; and”. (173.424(g) does not pertain to TACOM-RI Commodities)

173.424(h)—“The package is otherwise prepared for shipment as specified in 173.422”.

**173.422 Additional requirements – Certification Statement:** You shall 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. The statement of conformity must be verbatim as per 173.422 and this notice must include the name of the consignor or consignee.

#### **CERTIFICATION STATEMENT**

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

- There is a maximum of 2.0 TBq (54.1) total activity for H-3 that you may ship per package.

## **FIRE CONTROL DEVICES TRITIUM COMMODITIES TRITIUM COMMODITIES**

### **\*\*\*\*IMPORTANT NOTE\*\*\*\***

**The shipment of tritium commodities with damaged sources or sources suspected to be damaged will not be offered for transport.** Such commodities will be wipe tested before offering them for transport and if confirmed to have broken or damaged sources the commodities will be placed in a designated radioactive waste holding area.

### **\*\*\*\*END NOTE\*\*\*\***

**Isotope and Activity:** H-3, Various Activities

**Proper Shipping Name/Hazard Class/UN Number:**

Radioactive material, excepted package - instruments/7/UN2910.

**Chemical and/or Physical Form:** Tritium gas.

**Construction Form:** Normal form.

**Package Requirements:**

173.424(a)—“Each package meets the General Design Requirements of 49 CFR 173.410”. A card board box, wooded box, tri-haul box will suffice as long as it is serviceable.

173.424(b)—“The activity of the instruments or articles does not exceed the relevant limit listed in Table 7 in 173.425”. A single TACOM-RI Tritium Fire Control Device will not exceed this limit.

173.424(c)—“The total activity per package does not exceed the relevant limit listed in Table 7 in 173.425”. Your unit could conceivably exceed the total activity per package for Tritium, your package cannot exceed **216 Curies**, keep an accurate count of what goes into your package. However, when packaging multiple devices, into one package, weight, handling, and other requirements may apply as per 49 CFR 173.410.

173.424(d)—“The radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article does not exceed 0.1 mSv/hour (10 mrem/hour)”. The US Army does not currently have any instrument to conduct this test, the best ALARA principle here is to make sure the device you are shipping is SERVICEABLE.

173.424(e)—“The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5mrem/hour), or, for exclusive use domestic shipments, 0.02 mS v/hour (2 mrem/hour)”. Same as 173.424(d).

173.424(f)—“The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in 173.443(a)”. This requires that a wipe test of 300 square centimeters of the surface concerned, and that the removable contamination cannot exceed Table 11, in 173.443. Analysis results are required prior to shipment. The non-fixed (removable) radioactive contamination on the external surfaces of the package shall not exceed 22 dpm/cm<sup>2</sup> (beta). The U.S. Army is exempt from performing this wipe test if a NEW BOX (cardboard, plastic, wood, etc) is used in the shipment of the device.

173.424(g)—“Except as provided in 173.426, the package does not contain more than 15 grams of uranium-235; and”. (173.424(g) does not pertain to TACOM-RI Commodities)

173.424(h)—“The package is otherwise prepared for shipment as specified in 173.422”.

**173.422 Additional requirements – Certification Statement:** You shall 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. The statement of conformity must be verbatim as per 173.422 and this notice must include the name of the consignor or consignee.

#### **CERTIFICATION STATEMENT**

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

- There is a maximum of 8.0 TBq (216 Ci) total activity for H-3 that you may ship per package.

- For the RAM activity in each end article containing tritium, refer to instrument data plate, or TB 43-0116, Identification of Radioactive Items in the Army.

