

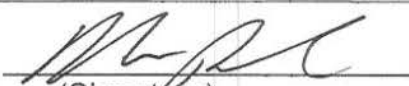
**ANDERSEN AFB RADIATION SAFETY OFFICER
SHIPMENT QUALITY ASSURANCE CHECKLIST**

Date: 18 Mar 11 Shipper: Andersen 735

Item Description	Radionuclide	Activity Each	Number of Items	Total Activity
ION Scan	Ni 63	10 mCi	1	10 mC

PACKAGE SURVEY INFORMATION
Instrument Make: <u>Canberra</u> Model: <u>ADM-300</u> S/N: <u>03092401</u> Cal date: <u>20100817</u>
Radiation Package Swipe Results (Beta): Area Swiped (cm ²) <u>100</u> Background: <u>0.0 cpm</u> Result: <u>0.0 cpm</u>
Radiation Package Swipe Results (Alpha): Area Swiped (cm ²) <u>100</u> Background: <u>0.0 cpm</u> Result: <u>0.0 cpm</u>
Instrument Make: <u>Canberra</u> Model: <u>ADM-300</u> S/N: <u>03092401</u> Cal date: <u>20100817</u>
Radiation Package Survey Results (gamma): Background: <u>9 µR/hr</u> Surface <u>9 µR/hr</u> 1 meter <u>9 µR/hr</u>

Person completing checklist: SSgt Marcus Poulos


(Signature)

EXCEPTED PACKAGE SHIPMENT

- | YES | NO | |
|-------------------------------------|--------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 1. Strong tight package (package that will not leak material during conditions normally incident to transportation). |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2. Radiation level at any point on the external surface of package less than or equal to 0.5 mRem/hr. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. Removable surface contamination less than 2.2 dpm/cm ² (alpha) or 22 dpm/cm ² (beta/gamma). |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Outside of the inner package or outside of package itself bears the marking "Radioactive". |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 5. Package contains less than 15 grams of U-235 (check yes if U-235 not present). |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 6. Notice enclosed in or on the package includes consignor or consignee and one of the following, as appropriate: |
| <input type="checkbox"/> | <input type="checkbox"/> | a. This package conforms to the conditions and limitations specified in 49CFR 173.421 for radioactive material, excepted package - limited quantity of material, <u>UN2910; 2911</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | b. This package conforms to the conditions and limitations specified in 49CFR 173.422 for radioactive material, excepted package - instruments or articles <u>UN2910</u> , or <u>2911</u> |
| <input type="checkbox"/> | <input type="checkbox"/> | c. This package conforms to the conditions and limitations specified in 49CFR 173.424 for radioactive material, excepted package - articles manufactured from depleted uranium, UN2910. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | 7. Activity less than 49 CFR 173.423. Shipment as: |
| <input type="checkbox"/> | <input type="checkbox"/> | a. Limited quantity: Permissible package limit: _____ Actual package activity: _____ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | b. Instrument or article: Permissible package limit: <u>100 Ci</u> Actual package activity: <u>10mCi</u>
Permissible maximum article activity: <u>10 Ci</u> Actual maximum article activity: <u>10 mCi</u> |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. For instruments and articles, the radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article does not exceed 10 mRem/hr. |

IMPORTANT: If you checked "no" to any item above, contact Base Radiation Safety Officer for further instructions.

**ANDERSEN AFB RADIATION SAFETY OFFICER
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**TYPE A QUANTITIES FOR SELECTED
RADIONUCLIDES
(49 CFR 173.435)**

ISOTOPE	A1(Ci)	A2(Ci)
²⁴¹ Am	54.1	0.00541
¹³³ Ba	40	10
¹⁴ C	1000	60
²⁵² Cf	2	0.009
⁵⁷ Co	90	90
⁶⁰ Co	7	7
¹³⁷ Cs	30	10
⁵⁵ Fe	1000	1000
³ H	1000	1000
(compressed, uncompressed, luminous paint, absorbed on solid carrier in water)		
³ H (other forms)	20	20
¹²³ I	50	50
¹²⁵ I	1000	50
¹²⁹ I	1000	2
¹³¹ I	40	10
¹⁹² Ir	20	10
^{85m} Kr (uncompressed)	100	100
^{85m} Kr (compressed)	3	3
⁸⁵ Kr (uncompressed)	1000	1000
⁸⁵ Kr (compressed)	5	5
⁶³ Ni	1000	100
³² P	30	30
²¹⁰ Po	200	0.2
²³⁹ Pu	2	0.002
²⁴⁰ Pu	2	0.002
²²⁶ Ra	10	0.05
¹⁸⁷ Re	Unlimited	Unlimited
⁹⁰ Sr	10	0.04
^{99m} Tc	100	100
⁹⁹ Tc	1000	25
²³² Th	Unlimited	Unlimited
Th (Nat)	Unlimited	Unlimited
²³⁸ U	Unlimited	Unlimited
U (depleted)	Unlimited	Unlimited
U (Nat)	Unlimited	Unlimited

OTHER DEFINITIONS

TRANSPORTATION INDEX (TI) - unit-less number, rounded up to nearest first decimal place; maximum mR/hr at one meter from package.

TYPE A PACKAGE - does not require competent authority approval; limited to A1 or A2 values (White I, Yellow II or Yellow III)

TYPE B PACKAGE - requires approval; NOT limited to A1 or A2 values (White I, Yellow II or Yellow III)

**ACTIVITY LIMITS-LIMITED QUANTITY,
INSTRUMENTS & ARTICLES
(49 CFR 173.425)**

NATURE OF CONTENTS	INSTRUMENTS & ARTICLES		
	INSTRUMENT LIMIT*	Package Limit	Limited Quantity
SOLIDS			
Special Form	10 ⁻² A1	A1	10 ⁻³ A1
Normal Form*	10 ⁻² A2	A2	10 ⁻³ A2
LIQUIDS			
³ H Water			
<0.1 Ci/liter			1000 Ci
0.1 - 1.0 Ci/liter			100 Ci
>1.0 Ci/liter			1.0 Ci
Other liquids	10 ⁻³ A2	10 ⁻¹ A2	10 ⁻⁴ A2
GASES			
** ³ H	20 Ci	200 Ci	20 Ci
Special Form	10 ⁻³ A1	10 ⁻² A1	10 ⁻³ A1
Other Form	10 ⁻³ A2	10 ⁻² A2	10 ⁻³ A2
NOTES			
* For mixture of Radionuclides, see 49 CFR 173.433(d)			
** These values also apply to Tritium in activated luminous paint and Tritium absorbed on solid carriers.			

**RADIATION LEVEL LIMITS
(49 CFR 172.403 & 173.441)**

LABEL CATEGORY	TRANSPORTATION INDEX (TI)	RADIATION LIMITS
White	N/A	≤ 0.5
mR/hr		
Yellow II	≤ 1.0	≤ 50
mR/hr		
Yellow III	≤ 10	≤ 200
mR/hr		

**PACKAGE RADIATION LEVEL LIMITS
(49 CFR 173.421(b), 173.422)**

LIMITED QUANTITY = ≤ 0.5 mR/hr on any surface
INSTRUMENTS & ARTICLES = ≤ 0.5 mR/hr on any surface. (≤ 10 mR/hr at 4 inches from external surface of instrument)

**REMOVABLE EXTERNAL PACKAGE
CONTAMINATION LIMITS
(averaged over 300 cm²)
(49 CFR 173.443)**

	μCi/cm ²	DPM/cm ²
Beta-Gamma emitters, nuclides with half-life less than 10 days, U-Natural, Th-Natural, ²³⁵ U, ²³⁸ U, ²³² Th, ²²⁸ Th, and ²³⁰ Th in ores or physical concentrates.	10 ⁻⁵	22.0
All other Alpha emitters	10 ⁻⁶	2.2