

CANBERRA

May 20, 2013

US Nuclear Regulatory Commission
ATTN: Lymari Sepulveda
Licensing Branch
Div. of Materials Safety and State Agreement
Office of Federal & State Materials & Environmental Management Programs
Washington DC 20555

SUBJECT: USNRC Request for additional information

REFERENCE: Docket No. 030-36154
Control No. 579625
License No. 06-15099-03E

Dear Ms. Sepulveda,

Canberra Industries, Inc. offers the following information in response to your letter dated April 22, 2013, regarding the activities under exempt distribution license 06-15099-03E:

1. Byproduct materials listed in our license to be distributed under 10 CFR 32.18: Ba-133, Cl-36, Cs-137, Co-60, Sr-90, Eu-155 and Na-22.

2. As per requirements in 10 CFR 32.18(c). The sealed check source capsules listed in Item 3.a through 3.d below are installed in a CANBERRA device intended for commercial distribution. We confirm that byproduct material manufactured as disks or planchettes listed in Item 3.e through 3.j below are not incorporated into manufactured or assembled commodity, product, or device intended for commercial distribution.

3. Letter dated December 12, 2012 line item 5 you require source manufacturer and model numbers for sources Canberra will distribute:

- a) 10 μ Ci of Ba-133, sealed check source capsule 218392-0 and manufactured currently by Eckert & Ziegler and from North American Scientific in the past.
- b) 1 μ Ci of Ba-133, sealed check source capsule 218392-1 and manufactured currently by Eckert & Ziegler and from North American Scientific in the past.
- c) 9 μ Ci of Cs-137, sealed check source capsule 218392-2 and manufactured by Eckert & Ziegler and from North American Scientific in the past.
- d) 0.1 μ Ci of Sr-90, sealed check source capsule 247158 and manufactured by Eckert & Ziegler and from North American Scientific in the past.
- e) Cl-36 Sealed check source by Eckert & Ziegler activated foil mounted on disk 310Bq P/N CIRB3029.
- f) Cs-137 sealed check source by IPL 2" planchette 30-50k dpm P/N EAB-137-PL,
- g) Co-60 Sealed check source By Eckert & Ziegler 25mm, 50mm wide planchette 500Bq and 600Bq P/N CKRB115889, CKR11052.
- h) Sr-90 Sealed check source by IPL 2" planchette 30-50k dpm P/N EAB-090-PL.
- i) Na-22 Sealed check sources by Spectrum Techniques 1 μ Ci P/N none available.
- j) Eu-155 Sealed check sources by Spectrum Techniques 1 μ Ci P/N none available.

4. Labels. Attachment #1 shows label examples from radioactive source manufacturers that we use for various exempt sources to distribute to our clients.

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5. In item 6 of our application we stated that sources will be distributed to persons exempt from licensing pursuant to 10 CFR 30.15(a)(9).

6. 10 CFR 32.14 (b)(4) states the applicant must submit information concerning the procedures for results of prototype testing to demonstrate the material will not become detached from the product and the byproduct material will not be released into the environment.

Canberra does not have any test data available for the check source assemblies that contained exempt quantities of Ba-133, Cs-137, or Sr-90 sealed sources. These devices were originally designed and manufactured from Tracer Lab Company in the 1960's before there were any extensive testing requirements and fall under the grandfather clause. We do not have any reports of source capsules in these devices becoming detached.

Questions regarding the addition of activities under exempt distribution license 41-14168-01E to exempt distribution license 06-15099-03E.

1. In our application dated December 18, 2012 we asked that the location at 107 Union Valley Road, Oak Ridge, Tennessee be added to our distribution license. During a conference call on March 31, 2013, we informed the NRC the intent of adding the Oak Ridge facility to our 06-15099-03E license, to terminate license 41-14168-01E and to continue the activities under license 06-15099-03E.

Activities, the list of byproduct material used at the Oak Ridge facility and the purpose for use are covered under Tennessee Radioactive Material license Number R-01013-E14 amendment 50.

2. As per the requirements of 10 CFR 32.18(b). We confirm that byproduct material will not be contained in any food, beverage, cosmetic, drug, or other commodity designed for ingestion or inhalation by, or application to, a human being.

3. As per 10 CFR 32.18(C). We confirm that byproduct material is NOT incorporated into any manufactured or assembled commodity, product, or device intended for commercial distribution.

4. As per 10 CFR 32.18(d) Labels and Brochure. Attachment #1 shows label examples from radioactive source manufacturers that we use for various exempt sources to distribute to our clients. Attachment #2 is a copy of the Eckert & Ziegler (Isotope Products) brochure.

5. As per 10 CFR 32.19(a). We confirm that we will not distribute more than 10 exempt quantities as set forth in 10 CFR 30.71 schedule B in any single transaction.

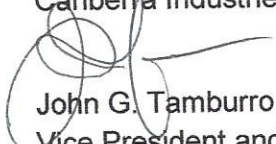
6. As per the requirements in 10 CFR 32.19(b). We confirm the each quantity of byproduct material set forth in 10 CFR 30.71 schedule B shall be separate and individually packaged.

7. As per the requirements in 10 CFR 32.19(c). We confirm that each quantity of byproduct material bears a durable legible label with isotope, quantity of radioactivity, with the words "Radioactive Material"

8. We confirm that labels affixed to the immediate container, or an accompanying brochure contains the information required by 10 CFR 32.19(d).

If you have any questions, please do not hesitate to get in touch with Ronald Como at 203-639-2431.

Sincerely,
Canberra Industries, Inc.


John G. Tamburro
Vice President and General Counsel
Enclosures: As stated

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SPECTRUM TECHNIQUES, INC.

106 Union Valley Road
Oak Ridge, TN 37830
USA

Tel: (865) 482-9937 Fax: (865) 483-0473

Email: sales@spectrumtechniques.com

Web: www.spectrumtechniques.com

RADIOACTIVE MATERIAL Limited Quantity UN2910

This package conforms to the conditions and limitations specified in 49 CFR 173.421, Postal Publication No. 6 dated September 1983, and BS 5288/C11111 for radioactive material, excepted package - limited quantity of material, UN2910, N.O.S. section 10.5.9.4, Radioactive Material in Limited Quantities.

Contents are exempt from NRC, agreement state and/or state licensing requirements.

The radiation exposure rate at any point on the external surface of the package does not exceed 0.5 millirem per hour.

No other labels are required—or authorized.

Radioactive Material ——— Not for Human Use ——— Introduction Into Foods, Beverages, Cosmetics, Drugs, or Medicinals, or Into Products Manufactured for Commercial Distribution is Prohibited ——— Exempt Quantities Should Not be Combined.

The quantities of radioactive material contained in these products is extremely small and present no known radiation hazard. However, it is always good practice to minimize exposure by following the basic principles of time, distance and shielding. Solid, sealed exempt quantity sources require no special handling but when working with liquid sources, gloves and laboratory coats are recommended.

Eating, drinking and smoking should be prohibited in areas where radioactive material is used or stored.

Use of radioactive material should be supervised by a responsible person in authorized areas. Exempt quantity products should be used only as intended and in accordance with instructions provided. All radioactive material should be securely stored when not in use.

These exempt quantity products may be disposed of in regular waste providing all radiation symbols have been removed or defaced. When disposing of liquid exempt quantities, it is recommended that they be flushed into the public sewer system diluted with large volumes of water.

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The following table presents the standard radioisotope products of Spectrum Techniques.

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[Lead Shields](#)

Note: For both Domestic and International Source Orders - Activities of gamma emitters over 5 to 10 uCi MAY require lead shielding, either LSD1, LSD4 or LSD5. If required, the lead shield and appropriate price will be added to your order.

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Model	Radioactive Material	Standard Activity /source (micro Ci)	Maximum Activity /source (micro Ci)	Half-life	Radiation	Energy (keV)	> 3 % Branch (%)
Ba-133	Barium 133	1,10	10	10.5 yrs	γ	30.6	34
					γ	30.9	62.9
					γ	35	18.6
					γ	81	32.8
					γ	276.3	7.3
					γ	302.7	18.6
					γ	355.9	62.3
C-14	Carbon 14	10	100	5730 yrs	b	156.48	100
					γ	22	85
Cd-109	Cadmium 109	1.5,8,10	10	462.6 d	γ	24.9	14
					γ	88	3.8
					γ	32.2	3.7
Cs-137	Cesium 137	0.1,1.5,8, 10 0.25	10	30.07 yrs	γ	661.6	84.6
					b	511.6	94.6
					b	1173.2	5.4
					γ	14.4	9.5
Co-57	Cobalt 57	1.5,10,20,25 50,75,100	100	271.79 d	γ	122.1	85.6
					γ	136.4	10.6
					γ	1173.2	99.9
Co-60	Cobalt 60	1	1	5.27 yrs	γ	1332.5	99.9
					γ	317.9	100.0
					b	39.5	16
Eu-152	Europium 152	1	1	13.5 yrs	γ	40	30
					γ		

					g	45	9
					g	121.8	28.4
					g	244.7	7.6
					g	344.3	26.5
					g	411.1	2.2
					g	443.9	2.8
					g	778.9	12.7
					g	867.3	4.2
					g	964	14.4
					g	1085.8	10
					g	1112	13.3
					g	1407.9	20.7
Fe-55	Iron 55	10,25,50,100	100	2.73 yrs	g	5.95	27
Mn-54	Manganese 54	1,5,10	10	312.3 d	g	834.8	99.9
Na-22	Sodium 22	1,5,8,10	10	2.60 yrs	g	511	79.8
					g	1274.5	99.9
Pb-210	Lead Nitrate (Needle source only)	0.01	0.01	22.3 yrs	g	10.8	24.3
					g	46.5	4.0
					b	63	19.8
					5 d	b	1161.4
				138.4 d	a	5304.5	99.9
Po-210	Polonium 210	0.1	0.1	138.4 d	a	5304.5	99.9
Sr-90	Strontium 90	0.1	0.1	28.8 yrs	b	546	100.0
				64.1 hr	b	2283.9	99.9
Tl-204	Thallium 204	1,5,10	10	3.78 yrs	b	763.4	97.4
Zn-65	Zinc 65	1,5,10	10	244.26 d	g	1115.5	50.8

NOTE: The following countries need prior approval from their local or national radiation control authorities to receive sources from Spectrum Techniques per IATA regulation dated Jan. 1, 201, 52nd edition for shipping radioactive material internationally.

Bahrain * NEW! Bangladesh - no rad Belgium China Egypt Fiji	Hong Kong India NEW! Italy NEW! Jordan Macao NEW! Malaysia	Saudi Arabia Singapore Sri Lanka NEW! Taiwan Ukraine United Arab Emirates
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NOTE: The following countries known to require prior approval from their local or national radiation control authorities to receive sources from Spectrum Techniques.

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Hong Kong	Singapore	
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International regulations control isotopes and limit activity of radioactive material that can be exported and shipped internationally.

Below is a list of Isotopes and the maximum activity that can be shipped internationally.

Below is a list of Spectrum Techniques

Please be aware of your country's regulations before placing your order.

standard Sources and Activities

These Sources and Activities

If your country permits users to receive higher activity, you must notify us at time of order.

can be exported and shipped Internationally.

Maximum Activity for International Shipment

Spectrum Techniques

Standard Isotopes and Activities

Model number	Nuclide	(uCi)	Nuclide	(uCi)	Bq	Bq
Ba133S	Ba133	1	Ba133	10	4.E+05	370000
C14LMW10	C-14	10	C-14	100	4.E+06	3700000
Cd109S	Cd-109	1	Cd-109	10	4.E+05	370000

Co57S	Co-57	1	Co-57	25	9.E+05	925000
Co60S	Co-60	1	Co-60	1	4.E+04	37000
Cs137S.25	Cs-137	0.25	Cs-137	0.25	9.E+03	9250
Cr51S	Cr51	1	Cr51	100	4.E+06	3700000
Eu152S	Eu-152	1	Eu-152	1	4.E+04	37000
Eu154S	Eu154	1	Eu154	1	4.E+04	37000
Eu155S	Eu-155	1	Eu-155	1	4.E+04	37000
Fe55LMW25	Fe-55	25	Fe-55	25	9.E+05	925000
I125TT (test tube)	I-125	0.25	I-125	0.25	9.E+03	9250
Mn54S	Mn-54	1	Mn-54	10	4.E+05	370000
Na22S	Na-22	1	Na-22	10	4.E+05	370000
Po210S	Po-210	0.1	Po-210	0.1	4.E+03	3700
Sn113S	Sn-113	1	Sn-113	10	4.E+05	370000
Sr90S	Sr-90	0.1	Sr-90	0.1	4.E+03	3700
Tl204S.25	Tl-204	0.25	Tl-204	0.25	9.E+03	9250
Zn65S	Zn-65	1	Zn-65	10	4.E+05	370000

3.

Special sources, source sets and systems for international customers.

International regulations control isotopes and limit activity of radioactive material that can be exported and shipped internationally. In order to follow these regulation we have created sources, source sets and systems that meet these regulations. These items contain sources that are designed to meet the international regulations and may be less than our standard activity. If your country allows higher activities or the user has a license, permit or approval from the proper authority to hold higher activities, we must be notified at the time of order in order to ship higher activity sources.

CS137S.25EU, Cs137 at 0.25 uCi

Tl204S.25EU, Tl204 at 0.25 uCi

RSS3EU, Co60 at 0.5 uCi, Po210 and Sr90 at 0.1 uCi

RSS4EU, Co60, Mn54, Na22 at 1.0 uCi and Cs137 at 0.1 uCi

RSS5EU, Po210, Sr90 at 0.1 uCi; Tl204, Cs137 at 0.25 uCi and Co60 at 1.0 uCi

RSS8EU, Ba133, Cd109, Co57, Co60, Mn54, Na22, Zn65 at 1.0 uCi and Cs137 at 0.1 uCi

Basic Nuclear Lab System EU, **RSS3EU**

Introductory Lab System EU, **RSS3EU**

Intermediate Nuclear Lab System EU, **RSS3EU**

SCA Spectrometer System EU, **RSS4**

(ICS) Advanced Spectrometer Lab for PC EU, **RSS8EU**

UCS-30 Advanced Spectrometer Lab for PC EU, **RSS8EU**

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