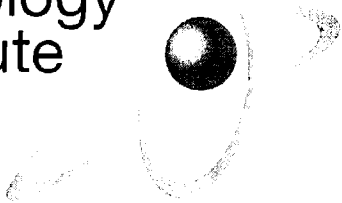


Cardiovascular Radiology Institute



Calle Dr. Manuel Pavia 611
Pavia Medical Plaza, Suite 113
Santurce, P.R. 00910

Teléfonos: 787.727.5402 / 268.1015 / 727.0500

Fax 787.268.5511

E-mail: gaudierx@gmail.com

L9
030 30800

December 20, 2018

United States Nuclear Regulatory commission

Region 1
2100 Renaissance Blvd., Suite 100
King of Prussia PA 19406-2713

Attention: Lester Tripp

RE: Termination of NRC License and Close-out Survey Results

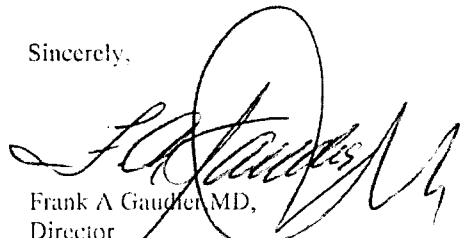
Dear Mr. Tripp:

Cardiovascular Radiology Institute would like to request the termination of our NRC license (52-250016-01). The necessary documentation for the termination of the license is enclosed. See additional details below: *25016-01 dmj*

1. NRC Form 314 enclosed for your review.
2. Radioactive materials (Tc-99m) used at this facility ceased on March 14, 2018. Sealed sources, including Cs-137, Ba-133 and Co-57 were used for equipment calibration. Please refer for the sealed source inventory for quantities of activity for sealed sources.
3. The licensee no longer possesses any radioactive materials.
4. Final status surveys of the areas of use are enclosed for your review.
5. Sealed source inventory, leak tests and recipient acknowledgement of receipt of sources are enclosed.
6. All radioactive material disposed via decay-in-storage has been disposed of in accordance with NRC: 10 CFR 35.92.

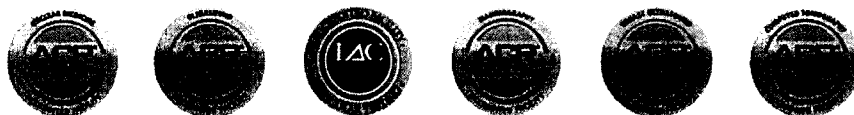
If you have any questions, please contact Ms. Grisel Alejandro, CNMT by email galejandro26@hotmail.com, or by phone at 787-458-7779.

Sincerely,


Frank A. Gaudier MD,
Director
Cardiovascular Radiology Institute

Rec'd. in LAT-12/27/2018

610896
INSTRUMENT MATERIALS-002





CERTIFICATE OF DISPOSITION OF MATERIALS

Estimated burden per response to comply with this mandatory collection request: 30 minutes. This submittal is used by NRC as part of the basis for its determination that the facility is released for unrestricted use. Send comments regarding burden estimate to the FOIA, Privacy, and Information Collections Branch (T-6 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to InfoCollect.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202, (3150-0028), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE NAME AND ADDRESS

Cardiovascular Radiology Institute
P.O. Box 11792, Indz. Luncas Station
Santurce, P.R. 00910-2891

LICENSE NUMBER

52-250016-01

DOCKET NUMBER

030-38860

LICENSE EXPIRATION DATE

November 30, 2024

A. LICENSE STATUS (Check the appropriate box)

- ☐ This license has expired. ☒ This license has not yet expired; please terminate it.

B. DISPOSAL OF RADIOACTIVE MATERIAL

(Check the appropriate boxes and complete as necessary. If additional space is needed, provide attachments)

The licensee, or any individual executing this certificate on behalf of the licensee, certifies that:

- ☐ 1. No radioactive materials have ever been procured or possessed by the licensee under this license.
- ☒ 2. All activities authorized by this license have ceased, and all radioactive materials procured and/or possessed by the licensee under this license number cited above have been disposed of in the following manner.
- ☐ a. Transfer of radioactive materials to the licensee listed below:
- ☒ b. Disposal of radioactive materials:
- ☐ 1. Directly by the licensee:
- ☐ 2. By licensed disposal site:
- ☒ 3. By waste contractor:
- ☒ c. All radioactive materials have been removed such that any remaining residual radioactivity is within the limits of 10 CFR Part 20, Subpart E, and is ALARA.

C. SURVEYS PERFORMED AND REPORTED

- ☒ 1. A radiation survey was conducted by the licensee. The survey confirms:
- ☒ a. the absence of licensed radioactive materials
- ☒ b. that any remaining residual radioactivity is within the limits of 10 CFR 20, Subpart E, and is ALARA.
- ☒ 2. A copy of the radiation survey results:
- ☒ a. is attached; or ☐ b. is not attached (Provide explanation); or ☐ c. was forwarded to NRC on: _____ Date _____
- ☐ 3. A radiation survey is not required as only sealed sources were ever possessed under this license, and
- ☒ a. The results of the latest leak test are attached; and/or ☒ b. No leaking sources have ever been identified.

The person to be contacted regarding the information provided on this form:

NAME	TITLE	TELEPHONE (Include Area Code)	E-MAIL ADDRESS
Grisel Alejandra, CNMT	Nuclear Medicine Technologist	(781) 458-7779	galejandro26@hotmail.com

Mail all future correspondence regarding this license to:

P.O. Box 11792 Indz. Luncas Station Santurce, P.R. 00910-2891

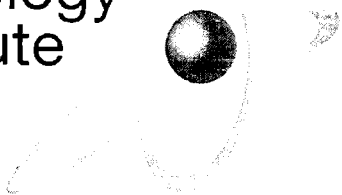
C. CERTIFYING OFFICIAL

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT

PRINTED NAME AND TITLE	SIGNATURE	DATE
Frank A. Gaudier, MD. Director		12/20/2018

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECT. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

Cardiovascular Radiology Institute



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E-mail: gaudierx@gmail.com

Close-out Survey

Date performed: December 13, 2018

Performed by: Grisel Alejandro, CNMT

Comments: Sealed sources and radioactive trash were removed from these areas prior to survey and wipe testing.

Instruments

Wipe tests analyzed with:

Gamma

Instrument:	Perkin Elmer
Instrument Model Number:	Wallac Wizard2
Instrument Serial Number:	8106671

Area survey performed with the following survey meter:

Manufacturer:	Ludlum
Type:	SM
Model Number:	14C
Probe Model:	Pancake
Calibration Date:	03/23/19

Radionuclides Used

Unsealed

Tc-99m, In-111, I-131, Ga-67, Tl-201 and Ra223

Sealed

Co-57, Cs137, Ba-133

Last date of byproduct radiopharmaceutical use:

March 14, 2018

Visual Check: The area was checked to ensure that all sealed sources and radioactive waste had been removed. No evidence of radioactive material was noted.

Sealed Source Leak Testing: Sealed Source Leak tests demonstrated no removable contamination.

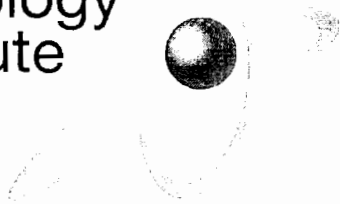
Leaking Sources: There is no history of leaking sources at this facility.

Radiation Level Survey: No area within the department demonstrated radiation levels in excess of the background reading of 0.02 mR/hr.

Removable contamination: No area within the department demonstrated removable contamination excess of 0 dpm.



Cardiovascular Radiology Institute



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Treadmill Room

Area	Result in dpms
#1 Entrance Floor & Door Knob	0
#2 Counter top, Cabinet Handles, Sink	0
#3 Bed, Step Stool	0
#4 Treadmill, Stand Type Spymomanometer	0
#5 Computer Desk, Chair	0
#6 Chair & Injection Cart	0
#7 Treadmill Floor #1	0
#8 Floor #2, Light switch	0

Hot Room

#9 Door knobs(2), Light Switch	0
#10 Floor	0
#11 L-Block, Lead Cove, Dose Calibrator, Counter Top	0
#12 Pb Cabinet/Waste	0
#13 Sink, Countertop, Cabinet handles	0

Camera Room

#14 Floor #1 (entrance)	0
#15 Entrance Door Knobs (2), Light Switches(2)	0
#16 Countertop, Cabinet handles	0
#17 Sink, Countertop, Cabinet handles	0
#18 Floor #2	0
#19 Camera bed, Hand control	0
#20 Collimator Carts	0
#21 Work Station Counter, Keyboards	0
#22 Floor#3	0

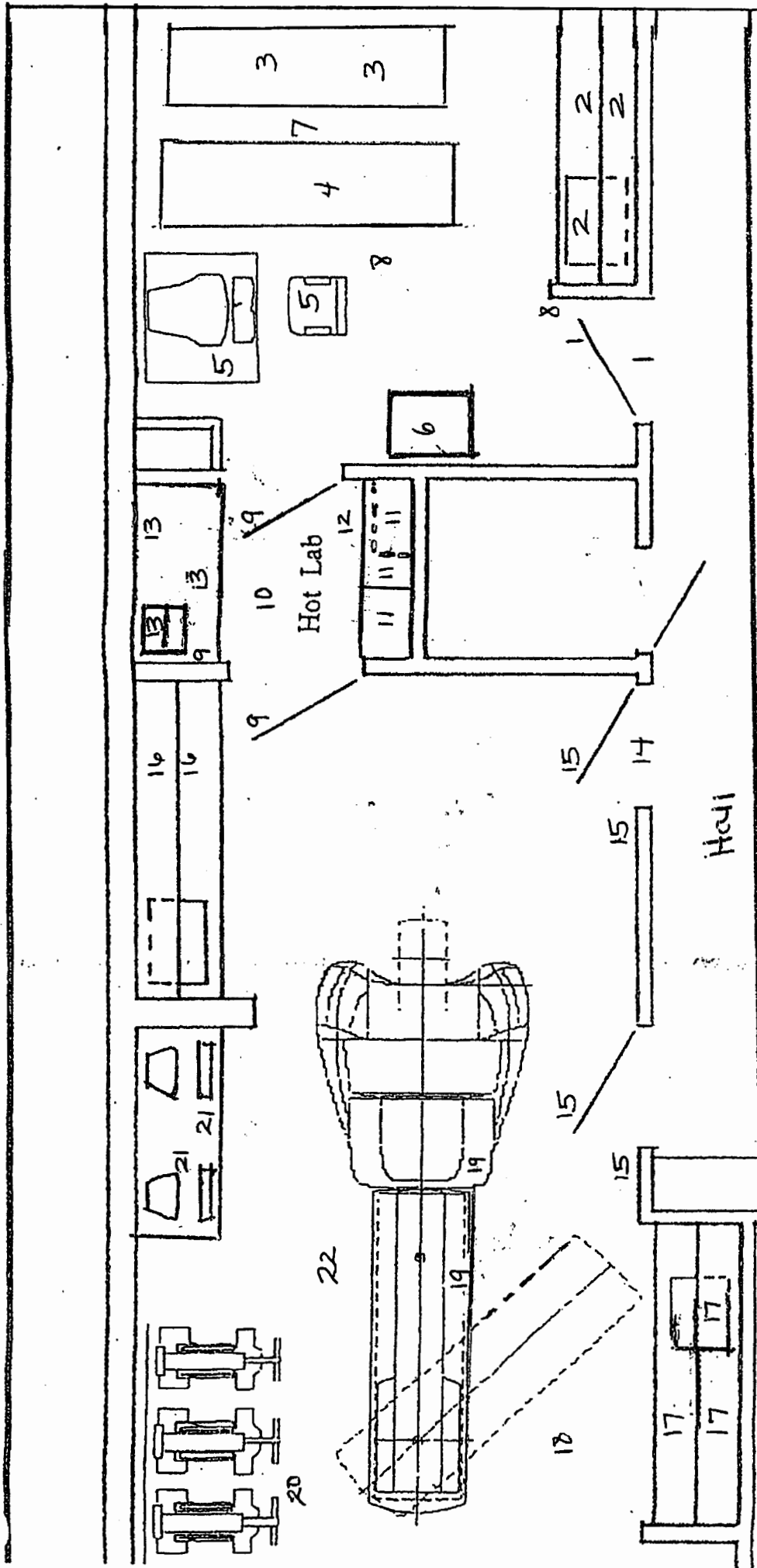
Background: 85 cpm

Maximum removable contamination = 0 dpm

Conclusion: No radioactive materials remain in these areas. No removable contamination is present.



Cardiovascular Radiology Institute



Leak Test Record
NRC License 52-25430-01

Leak Tested For: Cardiovascular Radiology Institute
Leak Tested By: David Rhoe

Standard Source: Cs-137 NES-139S
Standard Activity: 0.105 uCi Nominally
Date of Standard: 9-Sep-88

Date of Leak Test: 28-Nov-18
Decay Activity: 0.05224 From decay chart
Standard (dpm): 115973

Instrument: Gamma
Perkin Elmer
Instrument Model Number: Wallac Wizard2
Instrument Serial Number: 8106671

Standard (cpm) 28577
Efficiency: 0.24641 24.6 %
Counting time (minutes) 1
Background (cpm) 119
Minimum Detectable Activity: 2.820E-05

Wipe (Smear) Test: All external or accessible surfaces of the source or housing are wiped with a piece of filter paper or other absorbent material which has been moistened with an appropriate solvent and the activity removed is measured.

	Gamma	
Source ID and Serial Number	Wipe Test	Sample Activity
Co-57 1832-009 10 mCi 10-1-15	126	0.00023
Cs-137 S356008-12 218 uCi 7-13-88	134	0.00024
Ba-133 S358003-10 277 uCi 2-23-88	146	0.00027
Co-57 1639-92-5 10.14 mCi 5-1-13	137	0.00025
Co-57 122676 5.482 mCi 4-1-08	145	0.00027
Co-57 24793 11.92 mCi 7-1-02	134	0.00024
Co-57 S206101-025 5.4 mCi 10-15-97	110	0.00020
Co-57 A2824 10.71 mCi 1-1-95	111	0.00020

This test reveals that 0.005 microcuries or less was present as removable contamination. Should the removable contamination exceed 0.005 microcuries, the source must be removed from use and necessary measures taken according to NRC regulations.


David Rhoe Health/Medical Physicist

Date: January 22, 2018

SEALED SOURCE INVENTORY

I- Standard Sources Used for Calibration Constancy Check on Dose calibrator.

Isotope:	Co^{57}	Co^{137}	Po^{183}	Co^{57}	Co^{57}	Co^{57}	Co^{57}
Mfg:	E & Z Isotope Products	NES-356 NEN	NES-368 NEN	North Amer. Scientific	North Amer. Scientific	DU PONT	North Amer. Scientific
Serial #:	1639-92-5	356 008-12	358 003-10	122676	24793	206101-025	A 2824
Cal. Date:	May 1/2013	July 13/88	Feb 23/88	April 1/08	July 1/02	10/15/97	1/1/95
nom. Act.:	10.14 mCi	0.218 mCi	277 μ Ci	5.482 mCi	11.92 mCi	5.4 mCi	10.71 mCi
Location:	At lead brick enclosure at "hot" room and <u>IN USE</u>			Inside lead-lined box under the sink at "hot" room and <u>OUT OF USE</u>			

II FLOOD SOURCE

Isotope:	Co^{57}						
Mfg:	E & Z Isotope Products						
Serial #:	1832-009						
Cal. Date:	Oct 1/15						
nom. Act.:	10 mCi						
Location:	Imaging Room						

II- Other Sealed Sources

Inventory carried out by:
[Signature]

Isotope:	Co^{137}	Co^{137}				
Mfg:	the Nucleus					
Serial #:	?	S/N 4002				
Cal. Date:	?	Nov 92				
nom. Act.:	1 μ Ci	1 μ Ci				
Location:	At lead brick enclosure at "hot" room	Attached to side of GM Survey Meter				

B2 Return Packing List (RPL)

All information must be provided and legible to ensure proper handling of your return

Helpful hints before starting

Refer to your source certificate for information needed on this RPL.

Be prepared to make enough copies of sheet B2 to go inside each package to be returned. The original B1/B2 sheets will be used as the packing slip for this return.

If the quantity of sources to be returned exceeds the number of lines below (4), please make a copy of this sheet B2 and continue listing your sources.

ALL information **MUST** be legible, including email and phone number, so that FedEx and/or EZIP can contact the Shipper in case of questions or concerns.

From:	Send to:
Company Name <i>Cardiovascular Radiology Institute</i>	Attention: Receiving
Address <i>Calle Dr. Manuel Ponce 611 Suite 101</i>	Eckert & Ziegler Isotope Products
City <i>San Juan</i> State <i>PR</i> Zip <i>00910</i>	1800 North Keystone Street
RSO or Person responsible for Disposal Receipt Records <i>Grisel Alejandro, CNMT</i>	Burbank, California 91504
Phone <i>787-458-7779</i> Fax	Phone (661) 309-1010
Email <i>galejandro24@hotmail.com</i>	Fax (661) 257-8303
FedEx Tracking Number from FedEx Air Waybill	Email: nucmedsales@ezag.com
Please note that the Shipper is responsible for ALL return shipping costs	STOP
RA# <i>331560</i>	Original two-sided Sheet B1/B2 must be affixed to the OUTSIDE and a copy of the RPL (this page) placed inside of the package.
Write RA# on outside of package or use provided Return Authorization Label. Please allow a minimum of five (5) business days for disposal processing and generation of your emailed RAF (Return Acknowledgment Form). EZIP does not accept returns through the US Postal Service.	Each returned source to EZIP must be on a one-to-one equivalent source type exchange basis only.
	For additional returns, please contact EZIP customer service at: (661) 309-1010 for quoting information.
	Do not return if wipe test results are 5nCi or above, or the source is leaking or damaged. Contact your RSO for instructions.

Catalog Model #	Source Serial #	Nuclide	Original Activity	Original Ref. Date	Source Wipe Test < 5nCi
1. <i>Med 3709</i>	<i>1832-009</i>	<i>Co-57</i>	<i>10 mCi</i>	<i>1-06-15</i>	<input checked="" type="checkbox"/> Yes
2. <i>NES 206</i>	<i>5206101-025</i>	<i>Co-57</i>	<i>5.4 mCi</i>	<i>15-06-97</i>	<input checked="" type="checkbox"/> Yes
3. <i>MED 3550</i>	<i>122626</i>	<i>Co-57</i>	<i>5.482 mCi</i>	<i>1-06-08</i>	<input checked="" type="checkbox"/> Yes
4. <i>MED 3550</i>	<i>24793</i>	<i>Co-57</i>	<i>11.92 mCi</i>	<i>1-06-02</i>	<input checked="" type="checkbox"/> Yes

Keep a copy of this form for your records. It may be requested by your regulatory agency.

I acknowledge that the above information is true to the best of my knowledge.

Print Name and Sign: *Grisel Alejandro, CNMT* *Grisel Alejandro, CNMT*

For EZIP Use Only

EZIP has received the radioactive sources listed above, except as noted below

Receiver's Name:	Comp: ECKERT & ZIEGLER Date: 11Dec18	Shipping: 29.65
	Cont: ATTENTION: RECE Weight: 35 LBS	Special: 1.70
Sources not received:	City: BURBANK Reference: 0.00	Handling: 0.00
	State: CA Country: US	Total: 31.35
By: INTL ECONOMY CLS		N/A
TRCK: 6136 3196 7279		

Comp: ECKERT & ZIEGLE Date : 11Dec18
Con: ATTENTION: RECE Weight : 35 LBS
City: BURBANK Reference:
State: CA Country: US

Shipping : 29.85
Special : 1.70
Handling : 0.00
Total : 31.35

Svc: INTL ECONOMY CLR
TRK: 6136 3196 7279

ORIGIN ID: SIGA (787) 625-4145
JEAN GUADALUPE
CARDINAL HEALTH PR120
INTERNATIONAL DISTRIBUTION CENTER
CARR 165 KH 2.4 BLDG 10 - LOCAL B
GUAYNABO, PR 009658211
UNITED STATES US

SHIP DATE: 11DEC18
ACTWGT: 35.00 LB MAN
CAD: 0357518/CAFE3009

BILL SENDER
NO REF 30.37(q)

TO ATTENTION: RECEIVING
ECKERT & ZIEGLER ISOTOPE PRODUCTS
1800 NORTH KEYSTONE STREET

BURBANK CA 91504

(US)

(881) 309-1010

REF:

INVT

PSI

DEPT:



FedEx
Express



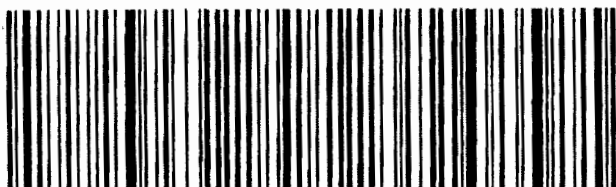
TRK# 6136 3196 7279
0430

THU - 13 DEC 4:30P
INTL ** 2DAY **

SH BURA

91504
CA-US BUR

Part # 156148-434 RIT2 09/14





Eckert & Ziegler
Isotope Products

B2

Return Packing List (RPL)

All Information must be provided and legible to ensure proper handling of your return

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From:	Send to:
Company Name <i>Cardiovascular Radiology Institute</i>	Attention: Receiving
Address <i>Calle Dr Manuel Pavia 611</i>	Eckert & Ziegler Isotope Products
<i>Pavia Medical Plaza, Suite 101</i>	1800 North Keystone Street
City <i>San Juan</i> State <i>PR</i> Zip <i>00910</i>	Burbank, California 91504
RSO or Person responsible for Disposal Receipt Records <i>Grisel Alejandro, CNMT</i>	Phone (661) 309-1010
Phone <i>787-458-7779</i> Fax	Fax (661) 257-8303
Email <i>galejandro26@hotmail.com</i>	Email: <i>nucmedsales@ezag.com</i>
<small>* Best Option</small>	STOP
FedEx Tracking Number from FedEx Air Waybill	Original two-sided Sheet B1/B2 must be affixed to the OUTSIDE and a copy of the RPL (this page) placed inside of the package.
Please note that the Shipper is responsible for ALL return shipping costs	Each returned source to EZIP must be on a one-to-one equivalent source type exchange basis only.
RA# <i>331560</i>	For additional returns, please contact EZIP customer service at: (661) 309-1010 for quoting information.
Write RA# on outside of package or use provided Return Authorization Label. Please allow a minimum of five (5) business days for disposal processing and generation of your emailed RAF (Return Acknowledgment Form). EZIP does not accept returns through the US Postal Service.	Do not return if wipe test results are 5nCi or above, or the source is leaking or damaged. Contact your RSO for instructions.

Catalog Model #	Source Serial #	Nuclide	Original Activity	Original Ref. Date	Source Wipe Test < 5nCi
1. <i>MED 3550</i>	<i>A 2824</i>	<i>Co-57</i>	<i>10.71 mCi</i>	<i>1-Jan-95</i>	<input type="checkbox"/> Yes
2. <i>BV-057-10M</i>	<i>1639-92-5</i>	<i>Co-57</i>	<i>10.14 mCi</i>	<i>1-MAY-13</i>	<input type="checkbox"/> Yes
3. <i>NES-358</i>	<i>5358003-10</i>	<i>Ba-133</i>	<i>0.277 mCi</i>	<i>23-Feb-88</i>	<input type="checkbox"/> Yes
4. <i>NES-356</i>	<i>5356008-12</i>	<i>Cs-137</i>	<i>0.218 mCi</i>	<i>13-Jul-88</i>	<input checked="" type="checkbox"/> Yes

Keep a copy of this form for your records. It may be requested by your regulatory agency.

I acknowledge that the above information is true to the best of my knowledge.

Print Name and Sign:

Grisel Alejandro, CNMT

Grisel Alejandro, CNMT

For EZIP Use Only

EZIP has received the radioactive sources listed above, except as noted below

Receiver's Name:

Comp: ECKERT & ZIEGLER Date: 12Dec18
Cont: ATTENTION: RECE Weight: 35 LBS
City: BURBANK Reference:
State: CA Country: US

Shipping: 28.65
Special: 48.20
Handling: 0.00
Total: 77.85

Sources not received:

N/A

Sigs: INTL ECONOMY CLR IDG

TRFV: 6136 2106 7222

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

(Provide at least three copies to the airline.)

Shipper JEANCARLOS GUADALUPE CARDINAL HEALTH PR120 INTERNATIONAL DISTRIBUTION CENTER CARR 165 KM 2.4 BLDG 10 - LOCAL B GUAYNABO, PR 00985 UNITED STATE, US		Air Waybill No. 6136-3196-7338 Page 1 of 1 Pages Shipper's Reference Number 331580			
Consignee ATTENTION: RECEIVING ECKERT & ZIEGLER ISOTOPE PRODUCTS 1800 NORTH KEYSTONE STREET BURKBANK, CA 91504					
Two completed and signed copies of this Declaration must be handed to the operator		WARNING Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.			
TRANSPORT DETAILS This shipment is within the limitations prescribed for: (delete non applicable) <table border="1"><tr><td><input checked="" type="checkbox"/> PASSENGER AIRCRAFT</td><td><input type="checkbox"/> CARGO AIRCRAFT ONLY</td></tr></table>		<input checked="" type="checkbox"/> PASSENGER AIRCRAFT	<input type="checkbox"/> CARGO AIRCRAFT ONLY	Airport of Departure GUAYNABO	
<input checked="" type="checkbox"/> PASSENGER AIRCRAFT	<input type="checkbox"/> CARGO AIRCRAFT ONLY				
Airport of Destination: LAX		Shipment type: (delete non-applicable) <input checked="" type="checkbox"/> NON-RADIOACTIVE <input type="checkbox"/> RADIOACTIVE			
NATURE AND QUANTITY OF DANGEROUS GOODS UN Number or Identification Number, proper shipping name, Class or Division (subsidiary risk), packing group (if required), and all other required information. UN 2915, Radioactive material, Type A package solution, Class 7, Cs-137 liquid, 1 Type A package x 0.003 GBq, II Yellow, TI 0.2 dims (L) 87 x (W) 12 x (H) 23 cm					
Additional Handling Information					
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations. I declare that all of the applicable air transport requirements have been met.		Name/Title of Signatory Jeancarlos Guadalupe/Customer Service Place and Date GUAYNABO 12/12/18 Signature (see warning above) JEANCARLOS GUADALUPE			
787-625-4145		Emergency Telephone Number			
FOR RADIOACTIVE MATERIAL SHIPMENT ACCEPTABLE FOR PASSENGER AIRCRAFT, THE SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN OR INCIDENT TO RESEARCH, MEDICAL, DIAGNOSIS, OR TREATMENT. ADR EUROPEAN TRANSPORT STATEMENT: CARRIAGE IN ACCORDANCE WITH 1.1.4.2.1					

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ALL information **MUST** be legible, including email and phone number, so that FedEx and/or EZIP can contact the Shipper in case of questions or concerns.

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Company Name <i>Cardiovascular Radiology Institute</i>	Attention: Receiving
Address <i>11111 N. Main Street, Suite 101</i>	Eckert & Ziegler Isotope Products
City <i>San Jose</i> State <i>PR</i> Zip <i>00910</i>	1800 North Keystone Street
RSO or Person responsible for Disposal Receipt Records <i>Grisel Alejandro, CNMT</i>	Burbank, California 91504
Phone <i>787-458-7779</i> Fax	Phone (661) 309-1010
Email <i>galejandro26@hotmail.com</i>	Fax (661) 257-8303
FedEx Tracking Number	Email: nucmedsales@ezag.com
from FedEx Air Waybill	
Please note that the Shipper is responsible for ALL return shipping costs	
RA# <i>331560</i>	STOP
Write RA# on outside of package or use provided Return Authorization Label.	Original two-sided Sheet B1/B2 must be affixed to the OUTSIDE and a copy of the RPL (this page) placed inside of the package.
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	Do not return if wipe test results are 5nCi or above, or the source is leaking or damaged. Contact your RSO for instructions.

Catalog Model #	Source Serial #	Nuclide	Original Activity	Original Ref. Date	Source Wipe Test < 5nCi
1. <i>Med 3709</i>	<i>1832-009</i>	<i>Co-57</i>	<i>10 mCi</i>	<i>1-06-15</i>	<input checked="" type="checkbox"/> Yes
2. <i>NES 206</i>	<i>5206101-025</i>	<i>Co-57</i>	<i>5.4 mCi</i>	<i>15-06-97</i>	<input checked="" type="checkbox"/> Yes
3. <i>MED 3550</i>	<i>122626</i>	<i>Co-57</i>	<i>5.482 mCi</i>	<i>1-04-08</i>	<input checked="" type="checkbox"/> Yes
4. <i>MED 3550</i>	<i>24793</i>	<i>Co-57</i>	<i>11.92 mCi</i>	<i>1-04-02</i>	<input checked="" type="checkbox"/> Yes

Keep a copy of this form for your records. It may be requested by your regulatory agency.

I acknowledge that the above information is true to the best of my knowledge.

Print Name and Sign: *Grisel Alejandro, CNMT* *Grisel Alejandro, CNMT*

For EZIP Use Only

EZIP has received the radioactive sources listed above, except as noted below

Receiver's Name:	Comp: ECKERT & ZIEGLER Date: 11Dec18	Shipping:	29.65
	Cont: ATTENTION: RECE Weight: 35 LBS	Special:	1.70
	City: BURBANK Reference:	Handling:	0.00
	State: CA Country: US	Total:	31.35
Sources not received:	SYN: INTL ECONOMY CLR		
	TRCK: 6136 3196 7279		

N/A

CERTIFICATE OF CALIBRATION

MODEL MED3550 GAMMA REFERENCE STANDARD

Radionuclide: Co-57 Activity: 441.0 MBq (11.92 mCi)
Serial Number: 24793 Reference Date: 1200 PDT July 1, 2002
Half Life⁽¹⁾: 271.77 ± 0.05 days

PRINCIPAL EMISSIONS⁽¹⁾

Type	Energy (keV)	Intensity (%)
gamma	14.4119	9.54
gamma	122.0612	85.5
gamma	136.4730	10.69

SOURCE DESCRIPTION

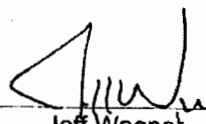
The activity is uniformly distributed throughout approximately 10 milliliters of epoxy resin and covered with 10 milliliters of inactive epoxy resin in a 30 milliliter polyethylene vial with an epoxy sealed cap.

METHOD OF CALIBRATION

The standard was calibrated by direct comparison to 10 milliliters of standardized solution traceable to the National Institute of Standards and Technology, in an identical geometry, using a pressurized ion chamber. Therefore, the activity value provided is equivalent to 10 milliliters of standardized solution. This standard is indirectly (implicitly) traceable to the National Institute of Standards and Technology.

North American Scientific, Inc. actively participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the Nuclear Energy Institute.

TOTAL UNCERTAINTY (99% Confidence Level) ± 4.00%


Jeff Wagner
Calibration Laboratory

July 3, 2002

Date

REFERENCES

(1) Table of Radioactive Isotopes, 7th edition, 1986.

• LEAK TEST CERTIFICATION ON REVERSE •

North American Scientific, Inc. 7435 Greenbush Ave., North Hollywood, CA 91605 (818) 734-8600 Fax (818) 734-5200

CERTIFICATE OF CALIBRATION

MODEL MED3550 GAMMA REFERENCE STANDARD

Rec April 15 / 08

Radionuclide: Co-57 Activity: 202.8 MBq (5.482 mCi)
Serial Number: 122676 Reference Date: 1200 PDT April 1, 2008
Half Life⁽¹⁾: 271.77 ± 0.05 days

PRINCIPAL EMISSIONS⁽¹⁾

Type	Energy (keV)	Intensity (%)
gamma	14.4119	9.54
gamma	122.0612	85.5
gamma	136.4730	10.69

SOURCE DESCRIPTION

The activity is uniformly distributed throughout approximately 10 milliliters of epoxy resin and covered with 10 milliliters of inactive epoxy resin in a 30 milliliter polyethylene vial with an epoxy sealed cap.

METHOD OF CALIBRATION

The standard was calibrated by direct comparison to 10 milliliters of standardized solution traceable to the National Institute of Standards and Technology, in an identical geometry, using a pressurized ion chamber. Therefore, the activity value provided is equivalent to 10 milliliters of standardized solution. This standard is indirectly (implicitly) traceable to the National Institute of Standards and Technology.

North American Scientific, Inc. actively participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the Nuclear Energy Institute.

TOTAL UNCERTAINTY (99% Confidence Level) ± 4.00%


Amy Chen
Calibration Laboratory

March 17, 2008
Date

REFERENCES

(1) Table of Radioactive Isotopes, 7th edition, 1986.

• LEAK TEST CERTIFICATION ON REVERSE •

20200 Sunburst Street, Chatsworth, CA 91311 • PH: (818) 734-8600 • Fax: (818) 734-5200

north american
SCIENTIFIC

C-0000918

Page 1 of 2

CERTIFICATE OF RADIOACTIVITY CALIBRATION

COBALT-57 REFERENCE SOURCE NES 206 S/N S206101-025
Half-Life: 271.7 days

The radiation output of this source was compared to a secondary standard of known activity content and showed a measured response of 200 MBq (5.4mCi) as of 10/15/97.*

DESCRIPTION OF THE SOURCE

The activity is uniformly distributed in a cast epoxy matrix equivalent to 20 milliliters of solution in a 27 milliliter polyethylene vial.

PRINCIPLE PHOTON EMISSIONS

ENERGY (keV)	14.4	122.1	136.5	692.0
INTENSITY (%)	9.54	85.6	10.58	0.16

REFERENCE: A Handbook of Radioactivity Measurements Procedures. NCRP Report No. 58, Second Edition. February, 1985.

METHOD OF CALIBRATION

This source was calibrated by direct measurement in an ionization chamber whose response for the radionuclide and source geometry was verified by using a secondary standard. This secondary standard was prepared gravimetrically in the Vial E geometry directly from a NIST calibrated solution of cobalt-57. Traceability of calibrations to NIST is maintained by participation in the USCEA-NIST Measurement Assurance Program.

RADIOIMPURITIES

The solution used to prepare this reference source was examined for photon emitting impurities with a Ge(Li) spectrometer system. The radioimpurity content was determined to be < 0.4% of the cobalt-57 based on the emission rate of the 122.1 keV gamma ray. The combined activity of the ⁵⁶Co & ⁵⁸Co impurity was 0.05% of the cobalt-57 on the calibration date.

ERRORS

Random Errors (99% confidence level)

Precision of the measurement of the source	± 0.6%
Precision of the measurement of the secondary standard	± 0.6%

Systematic Errors

Accuracy of the secondary standard (linear sum of the estimated upper limits of errors involved in preparation)	± 1.0%
Maximum error due to ⁵⁶ Co & ⁵⁸ Co impurities	± 2.0%

Overall Error

$$\sqrt{(0.6)^2 + (0.6)^2} + 1.0 + 2.0 = \pm 3.8\%$$

*For more information on calibration method, contact DuPont's customer Technical Services group. Some response variation can be expected between individual dose calibrators.

THIS VIAL "E" REFERENCE SOURCE CONTAINS ACCELERATOR PRODUCED RADIOACTIVE MATERIAL. THEREFORE, THE RADIATION CONTROL AGENCIES IN VARIOUS STATES EXERCISE REGULATORY AUTHORITY FOR THE RECEIPT, POSSESSION, USE AND TRANSFER OF THIS SOURCE.

076800-0792



Eckert & Ziegler
Isotope Products

Medical Imaging Laboratory
24937 Avenue Tibbitts Valencia, California 91355
Tel 661-309-1010 Fax 661-257-8303
Industrial Gauging and Medical Imaging Laboratory
1800 North Keystone Street Burbank, California 91504
Tel 661-309-1010 Fax 661-257-8303

NOMINAL SOURCE CERTIFICATE

Model Number: MED3709
Quantity: 1
Capsule Type: EZIP drawing #S3525-2
Active Region: 610 mm x 419 mm (24.0" x 16.5")
Type of Active Element: Co-57 dispersed onto stable print media
Cover: ABS Plastic
Backing: ABS Plastic
Nuclide Half Life: 271.79 ± 0.09 days
SS&DR Number: CA0510S120S
ISO Classification: ANSI 77C23313
Special Form Number: Not applicable
Recommended Replacement Date: 1-Apr-17

*Arrived
Sept 10/15*

Nuclide	Serial Number	Activity		Reference Date
Co-57	1832-009	10 mCi	370 MBq	1-Oct-15

Source Field Uniformity Measurement:

Source uniformity measurement of the 122/136 keV gamma emission was performed using a gamma camera scanning system. An array of "unit cells" was measured to calculate the uniformity data shown below.

Unit Cell Area:	0.91 cm ²	Integral Non-Uniformity (INU):	2.04%
Coefficient of Variation:	0.63%	Differential Non-Uniformity (DNU):	1.48%

Impurities: Co-56 and Co-58 combined is < 0.12% on 1-Oct-15

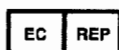
Leak Test Information is on the Reverse Side.

- Remarks:
- This document uses the numerical convention where 1.000 = 1 and 1,000 = 10³.
 - Nuclear data were taken from IAEA-TECDOC-619, 1991.
 - Coefficient of Variation: The standard deviation of the distribution of the measured values by the mean of measured values.
 - Integral Non-Uniformity: (Max - Min)/(Max + Min), where Max represents the largest measurement and Min represents the smallest measurement in the useful region.
 - Differential Non-Uniformity: (Max - Min)/(Max + Min) represents the largest deviation between a central value and the eight surrounding measurements.
 - Leak Test Frequency = 6 months

Ulrich Bopp
Signature

25-Aug-15
Date

Lab Book-Page: 1834-1-13



Authorized Representative

Eckert & Ziegler Nuclitec GmbH
Tel: +49 (0) 5307 9320 Fax: +49 (0) 5307 932 293
Gieselweg 1 38110 Braunschweig Germany

ISO 13485 CERTIFIED

CE

Leak Test Record
NRC License 52-25430-01

Leak Tested For: Cardiovascular Radiology Institute
Leak Tested By: David Rhoe

Standard Source: Cs-137 NES-139S
Standard Activity: 0.105 uCi Nominally
Date of Standard: 9-Sep-88

Date of Leak Test: 28-Nov-18
Decay Activity: 0.05224 From decay chart
Standard (dpm): 115973

Gamma

Instrument: Perkin Elmer
Instrument Model Number: Wallac Wizard2
Instrument Serial Number: 8106671

Standard (cpm) 28577
Efficiency: 0.24641 24.6 %
Counting time (minutes) 1
Background (cpm) 119
Minimum Detectable Activity: 2.820E-05

Wipe (Smear) Test: All external or accessible surfaces of the source or housing are wiped with a piece of filter paper or other absorbent material which has been moistened with an appropriate solvent and the activity removed is measured.

Gamma

Source ID and Serial Number	Wipe Test	Sample Activity
Co-57 1832-009 10 mCi 10-1-15	126	0.00023
Cs-137 S356008-12 218 uCi 7-13-88	134	0.00024
Ba-133 S358003-10 277 uCi 2-23-88	146	0.00027
Co-57 1639-92-5 10.14 mCi 5-1-13	137	0.00025
Co-57 122676 5.482 mCi 4-1-08	145	0.00027
Co-57 24793 11.92 mCi 7-1-02	134	0.00024
Co-57 S206101-025 5.4 mCi 10-15-97	110	0.00020
Co-57 A2824 10.71 mCi 1-1-95	111	0.00020

This test reveals that 0.005 microcuries or less was present as removable contamination. Should the removable contamination exceed 0.005 microcuries, the source must be removed from use and necessary measures taken according to NRC regulations.


David Rhoe Health/Medical Physicist

Comp: ECKERT & ZIEGLE Date : 11Dec18
Cont: ATTENTION: RECE Weight : 35 LBS
City: BURBANK Reference:
State: CA Country: US

Svc: INTL ECONOMY CLR
TRK: 6136 3196 7279

Shipping : 29.85
Special : 1.70
Handling : 0.00
Total : 31.35

ORIGIN ID: SIGA (787) 625-4145
JEAN GUADALUPE
CARDINAL HEALTH PR120
INTERNATIONAL DISTRIBUTION CENTER
CARR 165 KM 2.4 BLDG 10 - LOCAL B
GUAYNABO, PR 009656211
UNITED STATES US

SHIP DATE: 11DEC18
ACTWGT: 35.00 LB MAN
CAD: 0357518/CAFE3009

BILL SENDER
NO REF 30.37(4)

TO ATTENTION: RECEIVING
ECKERT & ZIEGLER ISOTOPE PRODUCTS
1800 NORTH KEYSTONE STREET

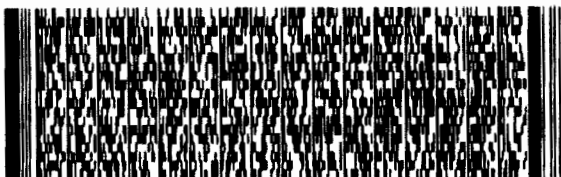
BURBANK CA 91504

(US)

(881) 808-1010
INVT
PG1

REF:

DEPT:



FedEx
Express



716111807260781

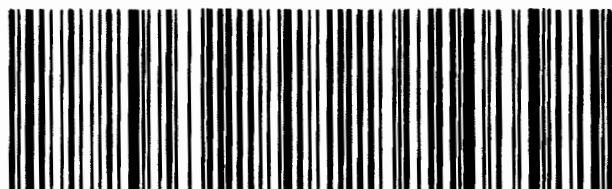
TRK# 6136 3196 7279
0430

THU - 13 DEC 4:30P
INTL ** 2DAY **

SH BURA

91504
CA-US BUR

Part # 156148-434 RIT2 09/14



B2 Return Packing List (RPL)

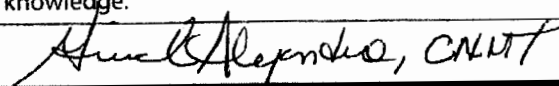
All information must be provided and legible to ensure proper handling of your return

Helpful hints before starting

Refer to your source certificate for information needed on this RPL.

Be prepared to make enough copies of sheet B2 to go inside each package to be returned. The original B1/B2 sheets will be used as the packing slip for this return. If the quantity of sources to be returned exceeds the number of lines below (4), please make a copy of this sheet B2 and continue listing your sources.

ALL information **MUST** be legible, including email and phone number, so that FedEx and/or EZIP can contact the Shipper in case of questions or concerns.

From:				Send to:		
Company Name <i>Cardiovascular Radiology Institute</i>				Attention: Receiving Eckert & Ziegler Isotope Products 1800 North Keystone Street Burbank, California 91504 Phone (661) 309-1010 Fax (661) 257-8303 Email: nucmedsales@ezag.com		
Address <i>Calle Dr Manuel Laria 611</i> <i>Laria Medical Plaza, Suite 101</i>						
City <i>Santerce</i>		State <i>PR</i>	Zip <i>00910</i>			
RSO or Person responsible for Disposal Receipt Records <i>Grisel Alejandro, CNMT</i>						
Phone <i>787-458-7779</i> Fax				<div style="border: 1px solid black; padding: 2px; display: inline-block;">STOP</div> Original two-sided Sheet B1/B2 must be affixed to the OUTSIDE and a copy of the RPL (this page) placed inside of the package. Each returned source to EZIP must be on a one-to-one equivalent source type exchange basis only. For additional returns, please contact EZIP customer service at: (661) 309-1010 for quoting information. Do not return if wipe test results are 5nCi or above, or the source is leaking or damaged. Contact your RSO for instructions.		
Email <i>galejandro26@hotmail.com</i> <small>* Best Option</small>						
FedEx Tracking Number from FedEx Air Waybill Please note that the Shipper is responsible for ALL return shipping costs						
RA# <i>331560</i> <small>Write RA# on outside of package or use provided Return Authorization Label. Please allow a minimum of five (5) business days for disposal processing and generation of your emailed RAF (Return Acknowledgment Form). EZIP does not accept returns through the US Postal Service.</small>						
Catalog Model #	Source Serial #	Nuclide	Original Activity	Original Ref. Date	Source Wipe Test < 5nCi	
1. <i>MED 3550</i>	<i>A 2824</i>	<i>Co-57</i>	<i>10.71 mci</i>	<i>1-Jan-95</i>	<input checked="" type="checkbox"/> Yes	
2. <i>BV-057-10M</i>	<i>1639-92-5</i>	<i>Co-57</i>	<i>10.14 mci</i>	<i>1-MAY-13</i>	<input checked="" type="checkbox"/> Yes	
3. <i>NES-358</i>	<i>5358003-10</i>	<i>Ba-133</i>	<i>0.277 mci</i>	<i>23-Feb-88</i>	<input checked="" type="checkbox"/> Yes	
4. <i>NES-356</i>	<i>5356008-12</i>	<i>Cs-137</i>	<i>0.218 mci</i>	<i>13-Jul-88</i>	<input checked="" type="checkbox"/> Yes	
Keep a copy of this form for your records. It may be requested by your regulatory agency.						
I acknowledge that the above information is true to the best of my knowledge.						
Print Name and Sign: <i>Grisel Alejandro, CNMT</i> 						
For EZIP Use Only						
EZIP has received the radioactive sources listed above, except as noted below						
Receiver's Name:	Comp: ECKERT & ZIEGLER Date: 12Dec18		Shipping:	29.65	N/A	
	Cont: ATTENTION: RECE Weight: 35 LBS		Special:	48.20		
	City: BURBANK Reference:		Handling:	0.00		
Sources not received:	State: CA Country: US		Total:	77.85		
<small>SYOB: INTL ECONOMY CLR 10G TANB: 6106 2106 7000</small>						

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

(Provide at least three copies to the airline.)

Shipper JEANCARLOS GUADALUPE CARDINAL HEALTH PR120 INTERNATIONAL DISTRIBUTION CENTER CARR 165 KM 2.4 BLDG 10 - LOCAL B GUAYNABO, PR 00965 UNITED STATE, US		Air Waybill No. 6136-3196-7338 Page 1 of 1 Pages Shipper's Reference Number 331560			
Consignee ATTENTION: RECEIVING ECKERT & ZIEGLER ISOTOPE PRODUCTS 1800 NORTH KEYSTONE STREET BURKBANK, CA 91504					
Two completed and signed copies of this Declaration must be handed to the operator		WARNING Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.			
TRANSPORT DETAILS This shipment is within the limitations prescribed for: (delete non applicable) <table border="1"><tr><td>PASSENGER AND CARGO AIRCRAFT</td><td>CARGO AIRCRAFT ONLY</td></tr></table>		PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY	Airport of Departure GUAYNABO	
PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY				
Airport of Destination: LAX		Shipment type: (delete non-applicable) <table border="1"><tr><td>NON-HAZARDOUS</td><td>RADIOACTIVE</td></tr></table>		NON-HAZARDOUS	RADIOACTIVE
NON-HAZARDOUS	RADIOACTIVE				
NATURE AND QUANTITY OF DANGEROUS GOODS <i>UN Number or Identification Number, proper shipping name, Class or Division (subsidiary risk), packing group (if required), and all other required information.</i> UN 2915, Radioactive material, Type A package solution, Class 7, Cs-137 liquid, 1 Type A package x 0.003 GBq, II Yellow, TI 0.2 dims (L) 87 x (W) 12 x (H) 23 cm					
Additional Handling Information					
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations. I declare that all of the applicable air transport requirements have been met.		Name/Title of Signatory Jeancarlos Guadalupe/Customer Service Place and Date GUAYNABO 12/12/18 Signature (see warning above) JEANCARLOS GUADALUPE			
787-625-4145		Emergency Telephone Number			
FOR RADIOACTIVE MATERIAL SHIPMENT ACCEPTABLE FOR PASSENGER AIRCRAFT, THE SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN OR INCIDENT TO RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT. ADR EUROPEAN TRANSPORT STATEMENT: CARRIAGE IN ACCORDANCE WITH 1.1.4.2.1					



Eckert & Ziegler
Isotope Products

Medical Imaging Laboratory
24937 Avenue Tibbitts Valencia, California 91355
Tel 661-309-1010 Fax 661-257-8303
Industrial Gauging and Medical Imaging Laboratory
1800 North Keystone Street Burbank, California 91504
Tel 661-309-1010 Fax 661-257-8303

NIST TRACEABLE CERTIFICATE GAMMA STANDARD SOURCE

RADIONUCLIDE: Co-57

REFERENCE DATE: 1 May 13, 12:00 PST

HALF LIFE: 271.79 \pm 0.09 days

CONTAINED RADIOACTIVITY: 10.14 mCi

CATALOG NO: RV-057-10M

CONTAINED RADIOACTIVITY: 375.2 MBq

SOURCE NO: 1639-92-5

SOURCE DESCRIPTION:

CAPSULE TYPE:	RV (27 ml polyethylene bottle)
NATURE OF ACTIVE DEPOSIT:	Co-57 dispersed in an epoxy matrix
ACTIVE DIAMETER/VOLUME:	Approx. 20 ml
BACKING:	Plastic
COVER:	Plastic

RADIOIMPURITIES:

Co-56 = 0.0347%; Co-58 = 0.00899% on 1 May 13.

METHOD OF CALIBRATION:

This source was assayed in a pressurized well-type ionization chamber.

UNCERTAINTY OF MEASUREMENT:

TYPE B (SYSTEMATIC) UNCERTAINTY:	\pm 3.0%
TYPE A (RANDOM) UNCERTAINTY:	\pm 0.0%
UNCERTAINTY IN ALIQUOT WEIGHING:	\pm 0.0%
TOTAL UNCERTAINTY AT THE 99% CONFIDENCE LEVEL:	\pm 3.0%

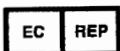
NOTES:

1. See reverse for leak tests performed on this source.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Material (As in NRC Regulatory Guide 4.15).
3. Nuclear data was taken from IAEA-TECDOC-619, 1991.
4. This source has a working life of 18 months.
5. ANSI N542-1977 Classification: ANSI 77C22212.

LAB BOOK-PAGE: 1639-92

Daniel James Van Dusen 13-Feb-13
SIGNATURE | DATE

ISO 13485 CERTIFIED



Authorized Representative

Eckert & Ziegler Nuclitec GmbH Gieselweg 1 38110 Braunschweig Germany
Tel: +49 (0) 5307 9320 Fax: +49 (0) 5307 932 293

CE



E.I. du Pont de Nemours & Co.
331 Treble Cove Road
Billerica, MA USA 01862
Telephone 800-225-1572
Mass. & International 617-482-9595

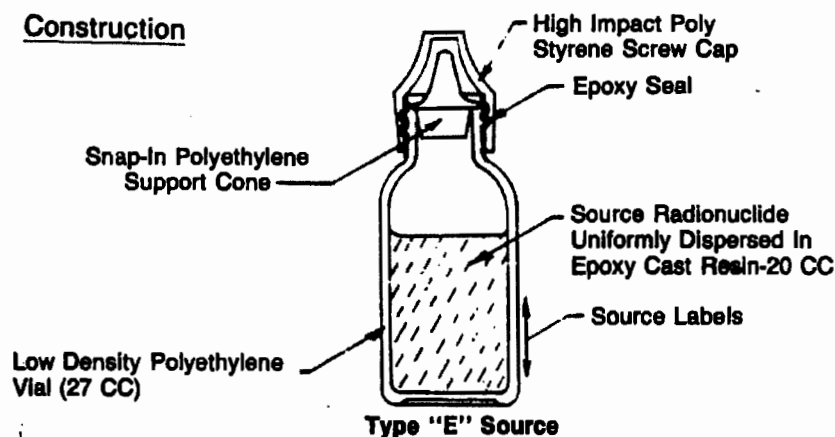
TECHNICAL DATA

Radiation Safety Instructions & Recommendations For Use & Storage of Vial Type "E" Ion Chamber Gamma Reference Source

MODEL NES-356 NUCLIDE Cs-137
LOT/SERIAL NO. S356008-12 CONTENT 0.218 MILLICURIE(S)

See Certificate for Calibration Data, if Applicable.

Construction



The Du Pont Product Vial Type "E" source has been designed and manufactured to provide maximum safety and service, having satisfied the safety performance requirements of ANSI Standard N5.10-1968 for Classification C22212, as recommended for calibration (reference) sealed sources.

Recommended Use & Service:

Du Pont Product Vial Type "E" Gamma Reference Sources are employed to maintain the calibration of ionization chamber type 'isotope calibrator' measurement systems utilized in nuclear medicine departments for assay of scanning agent radioactivity as prescribed for diagnostic procedures.

For maximum safety and service, Vial Type "E" sources should be used and stored at 10-40°C, 10-80% RH, ambient pressure, with care to avoid contact with strong organic solvents, hot surfaces, and excessive mechanical stress.

Radiation Safety Recommendations:

1. Radiation protection procedures utilized for handling and measurement of scanning agents are generally quite adequate for use of Type "E" Gamma Reference sources. Specific dose factors and effective lead shielding thicknesses for nuclides utilized in the Reference source series are provided in the following table to aid in effective exposure control.

Nuclide	\sim mR/hr/mCi @ 12" Unshielded	\sim Shielding Lead Half Value Thickness
Cobalt - 57 *	0.9	0.2 mm
Barium - 133 ‡	2.5	2.5 mm
Cesium - 137 ‡	3.5	6 mm
Cobalt - 60 ‡	14.2	11 mm

2. The source should be stored in the lead storage container provided with it. The source in its container should be stored in a restricted access compartment to prevent unauthorized use or removal. An accountability log should be maintained for this and all radioactive sources and devices on hand, listing pertinent data and specified storage location.
3. Disposal of "spent" or otherwise unusable sources should be made by the authorized radioactive waste disposal method for solid materials.
4. Vial Type "E" Gamma Reference Sources should be Leak Tested at maximum intervals of 6 months, or whenever seal integrity failure is suspected, using a reliable method (ANSI Std, N5.10-1968 Procedure B2.1 recommended) with measurement employing a counting system with nanocurie response sensitivity i.e. gamma scintillation counter.

Notice

- ‡ This approved model of the Du Pont Product Vial Type "E" Gamma Reference source is licensed by the U.S. Nuclear Regulatory Commission pursuant to Title 10 code of Federal Regulations Part 32.74 for distribution to persons licensed pursuant to 10CFR35.14 or an equivalent Agreement State License.

Receipt, use, or transfer of this source not pursuant to the above licensing is prohibited unless specifically licensed by USNRC or State Regulatory Authority.

- * The radioactive material contained in this Product is naturally occurring or Accelerator Produced; hence, the Radiation Control agencies in various states exercise Regulatory Authority for its receipt, possession, use and transfer.

CERTIFICATE OF RADIOACTIVITY CALIBRATION

Serial # S356008-12

CESIUM-137 REFERENCE SOURCE – NES-356

Half-Life: 30.0 years

The radiation output of this source was compared to a secondary standard of known activity content and showed a measured response of 8.1 MBq (0.218 mCi) as of 07/13/88.*

DESCRIPTION OF THE SOURCE

The activity is uniformly distributed in a cast epoxy matrix equivalent to 20 milliliters of solution in a 27 milliliter polyethylene vial.

PRINCIPLE PHOTON EMISSIONS

ENERGY (keV)	X-ray 31.8	X-ray 32.2	X-ray 36.4	661.7
INTENSITY (%)	2.0	3.7	1.34	85.1

Reference: *A Handbook of Radioactivity Measurements Procedures*, NCRP Report No. 58, Second Edition, February, 1985.

METHOD OF CALIBRATION

This source was calibrated by direct measurement with an ionization chamber whose response for the radionuclide and source geometry was verified by using a secondary standard. This standard was prepared gravimetrically in the Vial E geometry directly from an NBS calibrated solution of cesium-137.

Du Pont participates in a National Bureau of Standards — Atomic Industrial Forum measurement assurance program in order to insure the continuing traceability of Du Pont calibrations to NBS.

RADIOIMPURITIES

The solution used to prepare this reference source was examined for photon emitting impurities with a Ge(Li) spectrometer system. The radioimpurity content was determined to be <1% of the cesium-137 based on the emission rate of the 661.7 keV gamma ray.

ERRORS

Random Errors (99% confidence level)

Precision of the measurement of the source

± 0.6%

Precision of the measurement of the secondary standard

± 0.6%

Systematic Errors

Accuracy of the secondary standard (linear sum of the estimated upper limits of errors involved in preparation)

± 1.8%

Overall Error

$$[(0.6)^2 + (0.6)^2]^{1/2} + 1.8 =$$

± 2.6%

* For more information on calibration method, contact Du Pont's Customer Technical Services group. Some response variation can be expected between individual dose calibrators.

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E.I. du Pont de Nemours & Co. (Inc.),
331 Treble Cove Rd., No. Billerica, MA 01862
CALL TOLL-FREE 800-225-1572 Telex: 951451 or 6817017
(In Massachusetts & International: 617-482-9595)





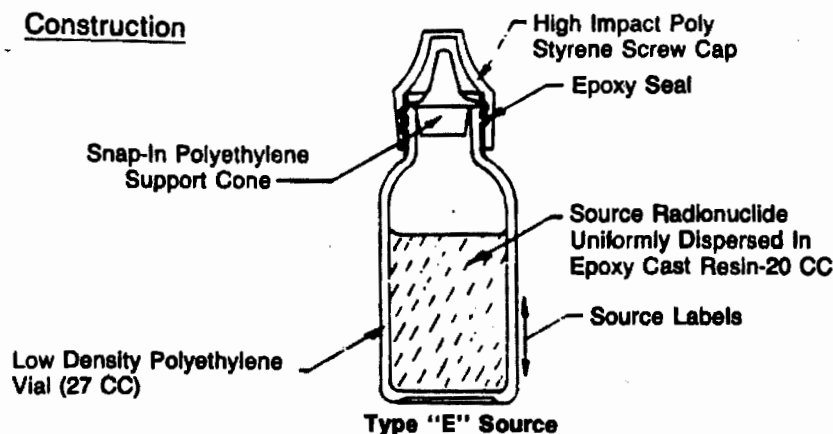
E.I. du Pont de Nemours & Co.
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Billerica, MA USA 01862
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Mass. & International 617-482-9595

TECHNICAL DATA

Radiation Safety Instructions & Recommendations For Use & Storage of Vial Type "E" Ion Chamber Gamma Reference Source

MODEL NES-358 NUCLIDE Ba-133
LOT/SERIAL NO. S358003-10 CONTENT 0.277 MILLICURIE(S)
See Certificate for Calibration Data, if Applicable.

Construction



The Du Pont Product Vial Type "E" source has been designed and manufactured to provide maximum safety and service, having satisfied the safety performance requirements of ANSI Standard N5.10-1968 for Classification C22212, as recommended for calibration (reference) sealed sources.

Recommended Use & Service:

Du Pont Product Vial Type "E" Gamma Reference Sources are employed to maintain the calibration of ionization chamber type 'isotope calibrator' measurement systems utilized in nuclear medicine departments for assay of scanning agent radioactivity as prescribed for diagnostic procedures.

For maximum safety and service, Vial Type "E" sources should be used and stored at 10-40°C, 10-80% RH, ambient pressure, with care to avoid contact with strong organic solvents, hot surfaces, and excessive mechanical stress.

Radiation Safety Recommendations:

1. Radiation protection procedures utilized for handling and measurement of scanning agents are generally quite adequate for use of Type "E" Gamma Reference sources. Specific dose factors and effective lead shielding thicknesses for nuclides utilized in the Reference source series are provided in the following table to aid in effective exposure control.

Nuclide	\sim mR/hr/mCi @ 12" Unshielded	\sim Shielding Lead Half Value Thickness
Cobalt - 57 *	0.9	0.2 mm
Barium - 133 ‡	2.5	2.5 mm
Cesium - 137 ‡	3.5	6 mm
Cobalt - 60 ‡	14.2	11 mm

2. The source should be stored in the lead storage container provided with it. The source in its container should be stored in a restricted access compartment to prevent unauthorized use or removal. An accountability log should be maintained for this and all radioactive sources and devices on hand, listing pertinent data and specified storage location.
3. Disposal of "spent" or otherwise unusable sources should be made by the authorized radioactive waste disposal method for solid materials.
4. Vial Type "E" Gamma Reference Sources should be Leak Tested at maximum intervals of 6 months, or whenever seal integrity failure is suspected, using a reliable method (ANSI Std, N5.10-1968 Procedure B2.1 recommended) with measurement employing a counting system with nanocurie response sensitivity i.e. gamma scintillation counter.

Notice

- ‡ This approved model of the Du Pont Product Vial Type "E" Gamma Reference source is licensed by the U.S. Nuclear Regulatory Commission pursuant to Title 10 code of Federal Regulations Part 32.74 for distribution to persons licensed pursuant to 10CFR35.14 or an equivalent Agreement State License.

Receipt, use, or transfer of this source not pursuant to the above licensing is prohibited unless specifically licensed by USNRC or State Regulatory Authority.

- * The radioactive material contained in this Product is naturally occurring or Accelerator Produced; hence, the Radiation Control agencies in various states exercise Regulatory Authority for its receipt, possession, use and transfer.

CERTIFICATE OF RADIOACTIVITY CALIBRATION

Serial # S358003-10

BARIUM-133 REFERENCE SOURCE – NES-358

Half-Life: 10.5 years

The radiation output of this source was compared to a secondary standard of known activity content and showed a measured response of 10.2 MBq (277 μ Ci) as of 2/23/88.*

DESCRIPTION OF THE SOURCE

The activity is uniformly distributed in a cast epoxy matrix equivalent to 20 milliliters of solution in a 27 milliliter polyethylene vial.

PRINCIPLE PHOTON EMISSIONS

ENERGY (keV)	X-ray 30.6	X-ray 30.9	X-ray 35.0	81.0	302.9	356.0
INTENSITY (%)	33.5	62.0	22.2	32.3	18.3	62.1

Reference: *A Handbook of Radioactivity Measurements Procedures*, NCRP Report No. 58, Second Edition, February, 1985.

METHOD OF CALIBRATION

This source was calibrated by direct measurement in an ionization chamber whose response for the radionuclide and source geometry was verified by using a secondary standard. This standard was prepared gravimetrically in the Vial E geometry directly from an NBS calibrated solution of barium-133.

Du Pont participates in a National Bureau of Standards — Atomic Industrial Forum measurement assurance program in order to insure the continuing traceability of Du Pont calibrations to NBS.

RADIOIMPURITIES

The solution used to prepare this reference source was examined for photon emitting impurities with a Ge(Li) spectrometer system. The radioimpurity content was determined to be <1% of the barium-133 based on the emission rate of the 356 keV gamma ray.

ERRORS

Random Errors (99% confidence level)

Precision of the measurement of the source

$\pm 0.6\%$

Precision of the measurement of the secondary standard

$\pm 0.6\%$

Systematic Errors

Accuracy of the secondary standard (linear sum of the estimated upper limits of errors involved in preparation)

$\pm 2.5\%$

Overall Error

$$[(0.6)^2 + (0.6)^2]^{1/2} + 2.5 =$$

$\pm 3.3\%$

* For more information on calibration method, contact Du Pont's Customer Technical Services group. Some response variation can be expected between individual dose calibrators.

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CERTIFICATE OF CALIBRATION

MODEL MED3550 GAMMA REFERENCE STANDARD

Radionuclide: Co-57 **Activity:** 396.3 MBq (10.71 mCi)
Serial Number: A2824 **Reference Date:** 1200 PDT January 1, 1995
Half Life⁽¹⁾: 271.77 ± 0.05 days

PRINCIPAL EMISSIONS⁽¹⁾

Type	Energy (keV)	Intensity (%)
gamma	14.4119	9.54
gamma	122.0612	85.5
gamma	136.4730	10.69

SOURCE DESCRIPTION

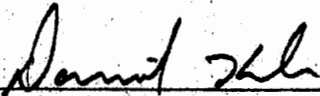
The activity is uniformly distributed throughout approximately 10 milliliters of epoxy resin and covered with 10 milliliters of inactive epoxy resin in a 30 milliliter polyethylene vial with an epoxy sealed cap.

METHOD OF CALIBRATION

The standard was calibrated by direct comparison to 10 milliliters of standardized solution traceable to the National Institute of Standards and Technology, in an identical geometry, using a pressurized ion chamber. Therefore, the activity value provided is equivalent to 10 milliliters of standardized solution. This standard is indirectly (implicitly) traceable to the National Institute of Standards and Technology.

North American Scientific, Inc. actively participates in the Radioactivity Measurements Assurance Program conducted by the National Institute of Standards and Technology in cooperation with the Nuclear Energy Institute.

TOTAL UNCERTAINTY (99% Confidence Level) ± 4.00%


Daniel Kalas
Calibration Laboratory Manager

January 6, 1995

Date

REFERENCES

(1) Table of Radioactive Isotopes, 7th edition, 1986.

• LEAK TEST CERTIFICATION ON REVERSE •

North American Scientific, Inc. 7435 Greenbush Ave., North Hollywood, CA 91605 (818) 503-9201 Fax (818) 503-0764

Leak Test Record
NRC License 52-25430-01

Leak Tested For: Cardiovascular Radiology Institute
Leak Tested By: David Rhoe

Standard Source: Cs-137 NES-1398
Standard Activity: 0.105 uCi Nominally
Date of Standard: 9-Sep-88

Date of Leak Test: 28-Nov-18
Decay Activity: 0.05224 From decay chart
Standard (dpm): 115973

Instrument: Gamma
Instrument Model Number: Perkin Elmer
Instrument Serial Number: Wallac Wizard2
8106671

Standard (cpm) 28577
Efficiency: 0.24641 24.6 %
Counting time (minutes) 1
Background (cpm) 119
Minimum Detectable Activity: 2.820E-05

Wipe (Smear) Test: All external or accessible surfaces of the source or housing are wiped with a piece of filter paper or other absorbent material which has been moistened with an appropriate solvent and the activity removed is measured.

Source ID and Serial Number	Gamma	
	Wipe Test	Sample Activity
Co-57 1832-009 10 mCi 10-1-15	126	0.00023
Cs-137 S356008-12 218 uCi 7-13-88	134	0.00024
Ba-133 S358003-10 277 uCi 2-23-88	146	0.00027
Co-57 1639-92-5 10.14 mCi 5-1-13	137	0.00025
Co-57 122676 5.482 mCi 4-1-08	145	0.00027
Co-57 24793 11.92 mCi 7-1-02	134	0.00024
Co-57 S208101-025 5.4 mCi 10-15-97	110	0.00020
Co-57 A2824 10.71 mCi 1-1-95	111	0.00020

This test reveals that 0.005 microcuries or less was present as removable contamination. Should the removable contamination exceed 0.005 microcuries, the source must be removed from use and necessary measures taken according to NRC regulations.


David Rhoe Health/Medical Physicist

Comp. ECKERT & ZIEGLE Date : 12Dec18
Cont: ATTENTION: RECE Weight : 35 LBS
City: BURBANK Reference:
State: CA Country: US

Shipping : 29.65
Special : 48.20
Handling : 0.00
Total : 77.85

Spec: INTL ECONOMY CLR IDG
TRCN: 6136 3196 7338

ORIGIN ID: SIGA (787) 625-4145
JEAN GUADALUPE
CARDINAL HEALTH PRI20
INTERNATIONAL DISTRIBUTION CENTER
CARR 185 KM 2.4 BLDG 10 - LOCAL B
GUAYNABO, PR 009856211
UNITED STATES US

SHIP DATE: 12DEC18
ACTWGT: 35.00 LB MAN
CAD: 0357518/CAFE3008

BILL SENDER
NO BSI 80.37(a)

TO ATTENTION: RECEIVING
ECKERT & ZIEGLER ISOTOPE PRODUCTS
1800 NORTH KEYSTONE STREET

540CLV/ITE/727

BURBANK CA 91504

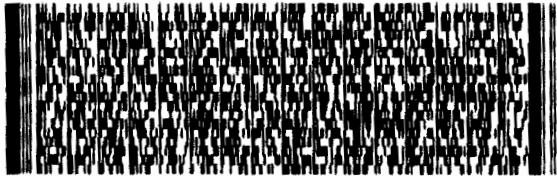
(US)

(881) 309-1010

REF:

INVT

DEPT:



FedEx
Express



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TAK# 6136 3196 7338
0430

FRI - 14 DEC 4:30P
INTL ** 2DAY **

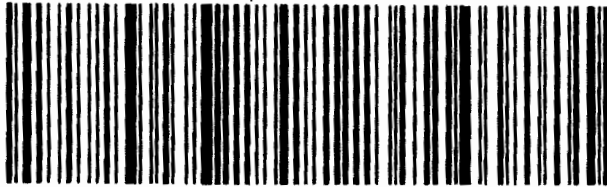
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CA-US BUR

SH BURA

Part # 156148-434 RT2 09/14





ACKNOWLEDGEMENT - RECEIPT OF CORRESPONDENCE

Name and Address of Applicant and/or Licensee Cardiovascular Radiology Institute ATTN: Frank A. Gaudier, M.D., Medical Director P. O. Box 11792 Fernandez Juncos Station Santurce, PR 00910-2891	Date December 27, 2018
	License Number(s) 52-25016-01
	Mail Control Number(s) 610896
	Licensing and/or Technical Reviewer or Branch Lester Tripp

This is to acknowledge receipt of your: ☒ Letter and/or ☐ Application Dated: 12/20/2018

The initial processing, which included an administrative review, has been performed.

☐ Amendment ☒ Termination ☐ New License ☐ Renewal

☒ There were no administrative omissions identified during our initial review.

☐ This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

☐ Your application for a new NRC license did not include your taxpayer identification number. Please complete and submit NRC Form 531, Request for Taxpayer Identification Number, located at the following link: <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc531.pdf>
Follow the instructions on the form for submission.

☐ The following administrative omissions have been identified:

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Your application has been assigned the above listed MAIL CONTROL NUMBER. When calling to inquire about this action, please refer to this control number. Your application has been forwarded to a technical reviewer. Please note that the technical review, which is normally completed within 180 days for a renewal application (90 days for all other requests), may identify additional omissions or require additional information. If you have any questions concerning the processing of your application, our contact information is listed below:

Region I
U. S. Nuclear Regulatory Commission
Division of Nuclear Materials Safety
2100 Renaissance Boulevard, Suite 100
King of Prussia, PA 19406-2713
(610) 337-5260, (610) 337-5313,
(610) 337-5398, or (610) 337-5239