

June 6, 2005

Mr. John D Kinneman United States Nuclear Regulatory Commission Region I – Division of Nuclear Materials Safety 475 Allendale Road King of Prussia, PA 19406-1415

Re: Final Decommissioning Report for License #37-30804-02 030362 39

Dear Mr. Kinneman,

Please find the attached USNRC Form #314 (Attachment I) and enclosed documentation to terminate license #37-30804-02 and release all areas from restricted-access classification.

As demonstrated in this report, all radioactive sources have been accounted for and safely removed as well as the successful completion of all surveys. Therefore, proving there is no residual radioactive material remaining within the site.

As outlined in the decommissioning plan, a USNRC licensed vendor, MDS Nordion, verified the number of sources and removed them from the 4000 AM Drive facility. The inventory was verified through the use of two separate documents, the GRAY*STAR, Inc. loading pattern and Reviss inventory documents. (refer to Attachment II) The shipping of all radioactive material from Quakertown, PA to Ottawa, Canada has also been documented on the enclosed Bill of Ladings.

After the removal of all sources, MDS Nordion successfully inspected the following items: (refer to Attachment III, MDS Nordion Decommissioning Report & Forms)

- Pool Water
- Pool Surface
- DI Resin
- All Source Holders
- All Plenum Tubes
- Source Handling Tools
- **Transport Containers**

A second vendor, RSO Inc., was used to verify the absence of radioactive material within the following filters: (refer to Attachment IV, RSO, Inc. Report of Sample Analysis)

- Three Pool Water Filters
- Two Plenum Air Filters

Once all equipment and water scan data was documented, the pool water was removed to gain access to the pool floor. A survey was performed around the top rim and bottom surface. This scan found no detectable radiation readings above normal background levels. (refer to Attachment V)

All source handling and support equipment have been accounted for and will be returned to the original manufacturer, CHL Systems, after final approval for their release has been granted by the USNRC.

After USNRC approves the termination of the CFC Logistics license, please return the financial assurance certificates for decommissioning to Mr. Jim Wood.

Sincerely,

Luke Trauger

Operations Manager / RSO

NRC FORM 314 U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0028	EXPIRES: 06/30/200
(6-2004) 10 CFR 30.36(j)(1); 40.42(j)(1);	Estimated burden per response to comply with	this mandatory collection request: 30 minute
CERTIFICATE OF DISPOSITION OF MATERIALS	This submittal is used by NRC as part of the released for unrestricted use. Send comments: FOIA/Privacy Services Branch (T-5 F52), U.S. Nu. 20555-0001, or by internet e-mail to infocollect Information and Regulatory Affairs, NEOB-102 Budget, Washington, DC 20503. If a means use display a currently valid OMB control number, person is not required to respond to, the informati	regarding burden estimate to the Records an iclear Regulatory Commission, Washington, D s@nrc.gov, and to the Desk Officer, Office 502, (3150-0028), Office of Management an id to impose an information collection does in the NRC may not conduct or sponsor, and
LICENSEE NAME AND ADDRESS	LICENSE NUMBER	DOCKET NUMBER
CFC Logistics	37-30804-02	030-36239
4000 AM Drive	LICENSE EXPIRATION DATE	~ / '>
Quakertown, PA 18951	August 31, 20)13
This license has expired. A. LICENSE STATUS (Check the This license has not yet expired; please the things of the	e appropriate box) e terminate it.	
B. DISPOSAL OF RADIOACT (Check the appropriate boxes and complete as necessary. If additional space is not be license, or any individual executing this certificate on behalf of the license.	eeded, provide attachments)	
No radioactive materials have ever been procured or possessed by	·	
2. All activities authorized by this license have ceased, and all radioact under this license number cited above have been disposed of in the a. Transfer of radioactive materials to the licensee listed below: MDS Nordion, Office, Canada	tive materials procured and/or po following manner.	ssessed by the licensee
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 remai Part 20, Subpart E, and is ALARA.	ning residual radioactivity is withi	n the limits of 10 CFR
C. SURVEYS PERFORMED A		
1. A radiation survey was conducted by the licensee. The survey confirm	ms:	
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	٩.
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 per	ossessed under this license, and	Dato
a. The results of the latest leak test are attached; and/or	b. No leaking sources have eve	er been identified.
The person to be contacted regarding the information provided on this form: NAME Jin Wood April 211 future correspondence regarding this license to: Tin 4 Jan 1	TELEPHONE (Include An 215-368-2 X8331	
C. CERTIFYING OFFI	CIAL SOURCES TOUT AND ASSESSED	· · · · · · · · · · · · · · · · · · ·

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.

SIGNATURE

PRINTED NAME AND TITLE

Tranger

Cobalt-60 Loading Pattern For Genesis Irradiator(tm)

Total Activity: 938,300 curies

Pattern #3

2nd. Loading: Recommended by GRAY*STAR, Inc.

Decay Date: November 1, 2004

Total Number of Pencils: 82

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A (top):															1	
Source Number	15863EE	15563EE	15570EE		15865EE	17023EE	17071EE	17041EE	16935EE	17043EE	17115EE	17014EE		15862EE	15857EE	15573EE
Activity (curies)	9,600	10,200	10,300		10,700	11,700	11,800	11,900	11,900	11,800	11,700	11,700		10,300	10,200	10,100
Source Number	17118EE	17022EE	17089EE			17121EE	17120EE			17113EE	16963EE			17122EE	17088EE	17119EE
Activity (curies)		12,300	12,100			11,900	11,800			11,800	11,900			12,100	12,300	12,400
Source Number	15582EE	15566EE													15576EE	15694EE
Activity (curies)	11,000	10,300													10,500	10,700
Source Number	17066EE	16942EE													16939EE	17062EE
Activity (curies)	11,900	12,200													12,000	12,000
Holder Activity	45,200	45 000	22,460	i o	10,700	23,600	23,600		11,900	23,600	23,600	11700	0 :	22,400	45,000	45,200
B (middle):																
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Activity (curies)	12,000			11,800	11,700		12,000	10,000	10,000	12,000		31,700	11,000	1		
Source Number			17025EE												17124EE	4
Activity (curies)		11,900	12,000									-		12,000	11,800	
Holder Activity	12,000	22200	Person i	HE BOO	71-700		(e.dop	40,600	ng Geg	12 000		11 700 ¹	11,800	22,400	22 200	12,000
C (bottom):												-				
Source Number	15578EE	15859EE	15689EE		17083EE	17010EE	17061EE	17112EE	17101EE	17046EE	15987EE	17067EE		17056EE	15864EE	15861EE
Activity (curies)	10,100	10,200	10,300		11,900	11,700	11,800	11,900	11,900	11,800	11,500	11,900		11,900	10,200	10,100
Source Number	17075EE	17072EE	17100EE			17123EE	17070EE			17013EE	17063EE			15571EE	17076EE	17105EE
Activity (curies)		12,300	12,100			11,900	11,800			11,800	12,100			10,400	12,300	12,400
Source Number	15696EE	15680EE													15575EE	15687EE
Activity (curies)	10,700	10,500					,								10,500	10,700
Source Number	17047EE	17107EE	1												17106EE	17065EE
Activity (curies)		12,000													12,000	12,000
Holder Activity	45,200	45,000		o la	11 900	F-5/3000	PREMIUM	in gui	11 400	28 600	26 600	#11-800	i i i i	22,300	45,000	45,200
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6	15693EE	12.2		
7	15680EE	12.1		ω_{ω}
8	15983EE	12.0	/_	•
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14	15861EE	11.7		
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9	15576EE	12.1]
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11	15563EE	11.8		
12	15864EE	11.8		
13	15865EE	12.4	/	
14	15987EE	13.3		
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2nd (oad

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8	17112EE	11.8		10
9	17025EE	11.9		
10	17108EE	11.9		
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13	17017EE	12.0		
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7	17067EE	11.8	1	1
8	17041EE	11.9	1	DE
9	17069EE	11.9	/	
10	17066EE	11.9		
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12	17047EE	11.9		
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17	17089EE	12.1		
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SOURCE LISTING FOR CFC LOGISTICS CONTAINER NUMBER: 3750A/05

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7	17120EE	11.8	
8	17123EE	11.8	
9	17101EE	11.8	
10	17121EE	11.9	
11	16935EE	11.9	
12	16939EE	12.0	
13	17103EE	12.0	
14	17122EE	12.0	1
15	17100EE	12.1	
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17	17119EE	12.4	1
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KRISKA TRANSPORT

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R200366/1

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CFC LOGISTICS PER DATE PER 05 MAY 19

STRAIGHT BILL OF LADING ORIGINAL - NOT NEGOTIABLE

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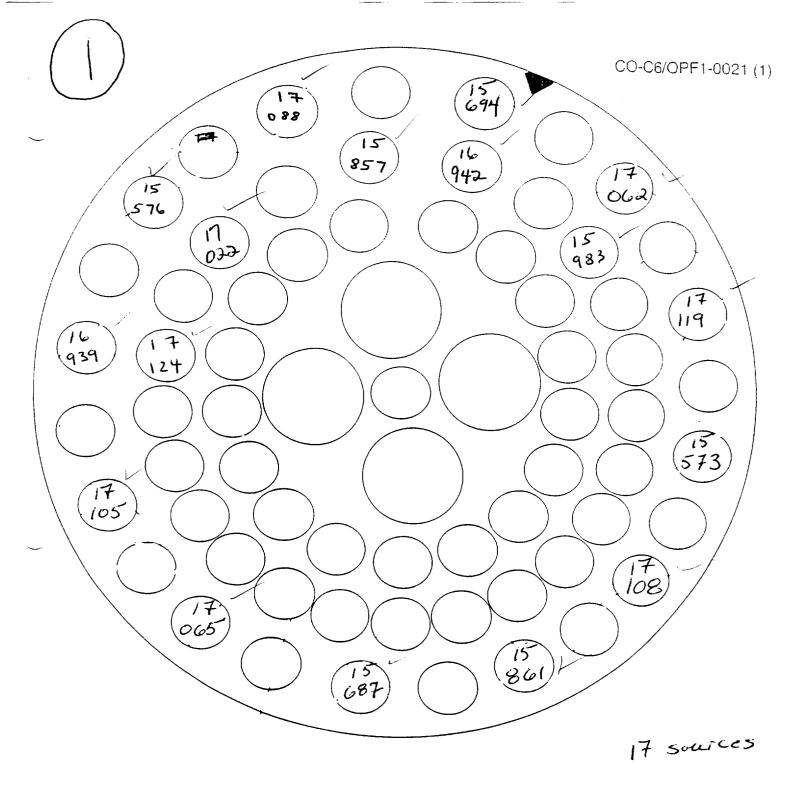
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PAGE 1 SHIPMENT ID NUMBER

R200366

FREIGHT BILL PRO NO. CARRIER USE

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F168

S/N: _____

Carrier Model:

F234

S/N: 216

Container Number:

1 of 1

Loading Date:

Order Number:

20036

Container Activity:

107663 Curies

(6943.5 TBq)

Activity Reference Date:

2003/06/13

Report Date:

2003/06/10

200366

180681 C:

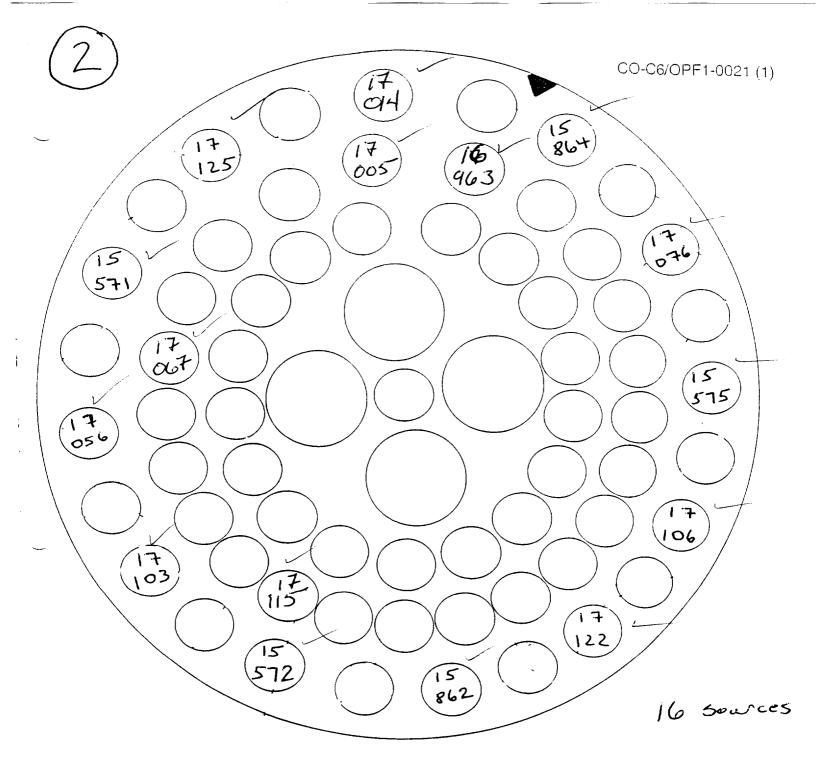
Co 692 TBq May 18,2005

Source Allocation System

MDS Nordion

Science Advancing Health:

Loading Chart for F168 Source Carrier



F168

Carrier Model:

F234

s/N: 586

Container Number:

1 of 1

Loading Date:

Order Number:

₹06954B

Container Activity:

187663 Curies-

(6943.5 TBq)

Activity Reference Date:

2003/86/13

Report Date:

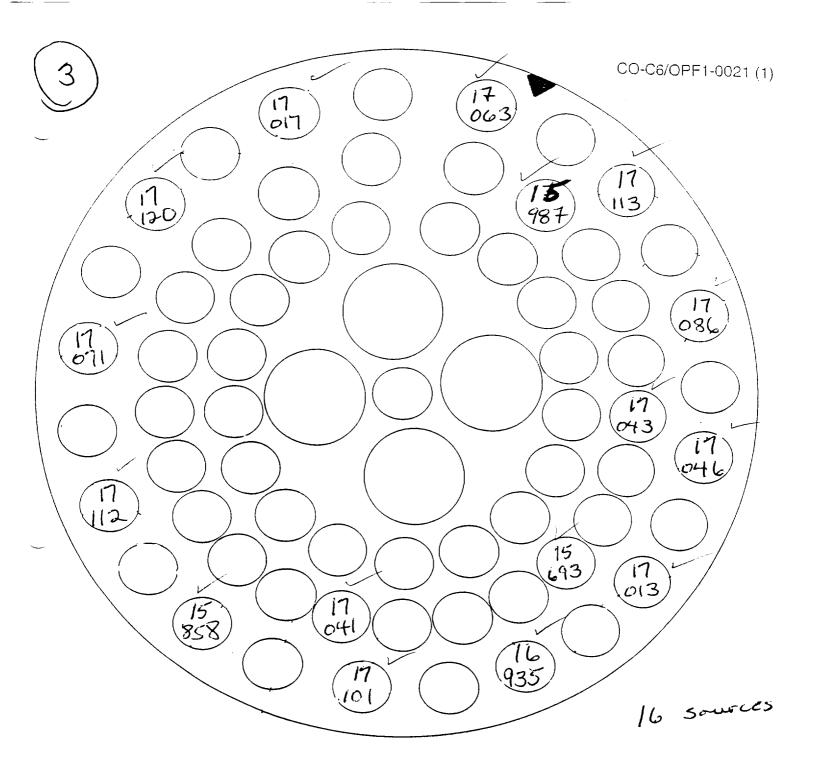
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200366 170,163 Ci 6302 TBq May 18,2005

MDS Nordion

Science Advancing Health

Loading Chart for F168 Source Carrier



F168

Carrier Model:

F234

S/N:

200366

Container Number:

1 of 1

Loading Date:

Order Number:

660548

Container Activity:

187663 Carries

(6943.5 TBq)

Activity Reference Date:

2003/06/13

Report Date:

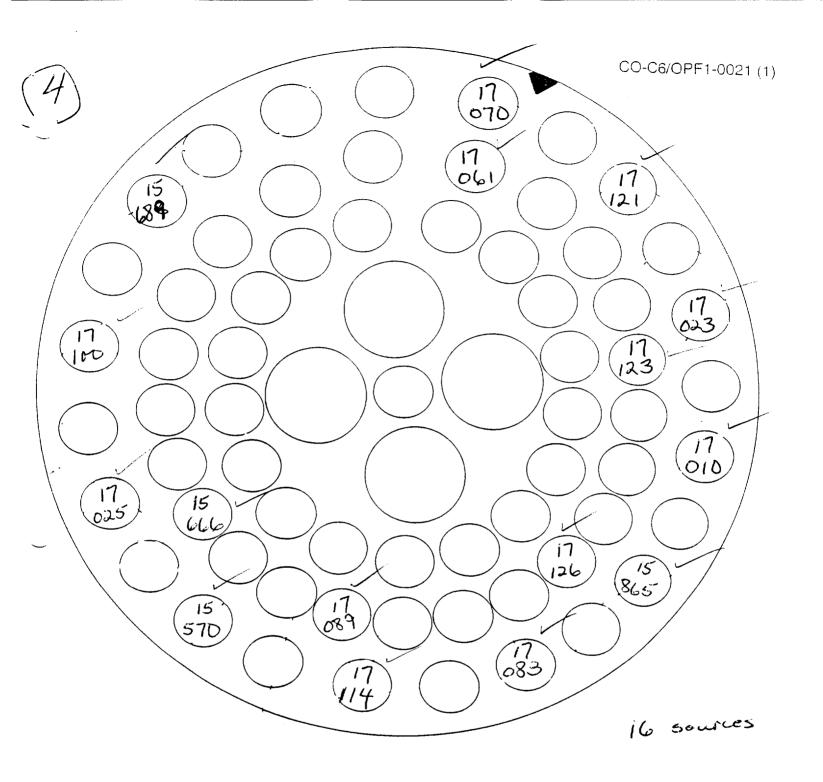
2005/06/10

174258 Ci 6454 TBg May 18, 2005

MDŚ Nordion

Science Advancing Health

Loading Chart for F168 Source Carrier



F168

S/N: _____

Carrier Model:

F234

S/N: 562

Container Number:

1 of 1

Loading Date:

Order Number:

66954B

200366

Container Activity:

Report Date:

18**7663 Carios**

171373 Ci

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6049. C. TD... \

6347 TBq, may 18, 2005

Activity Reference Date:

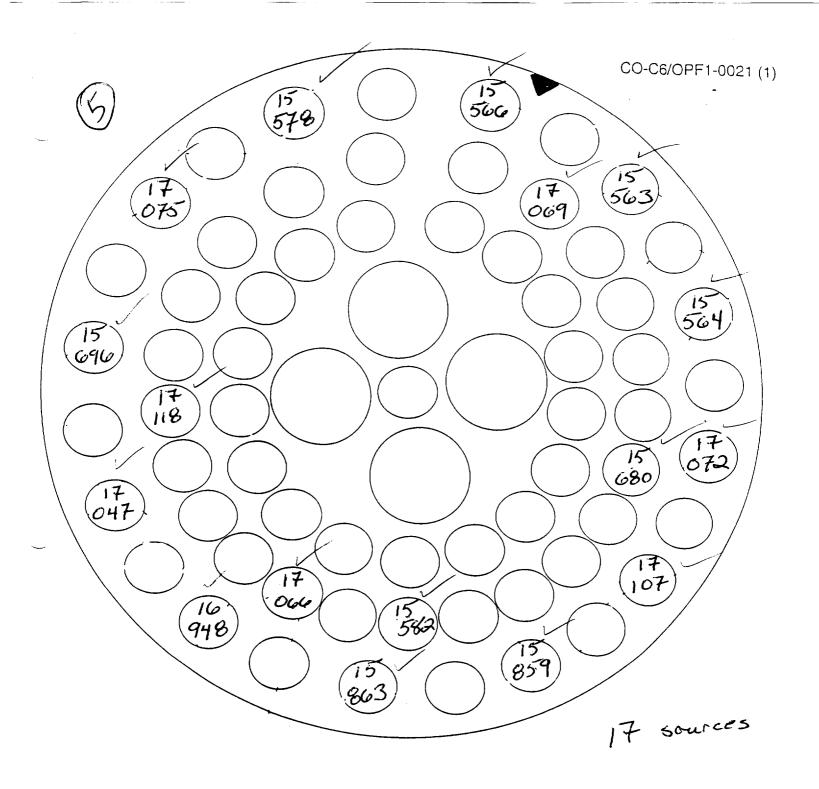
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2003/06/10

MDS Nordion

Science Advancing Health

Loading Chart for F168 Source Carrier



F168

Carrier Model:

F234

Container Number:

1 of 1

Loading Date:

Order Number:

200360 66954B

Container Activity:

187663 Gurios

(6943.5 TBq)

Activity Reference Date: 2003/06/13

Report Date:

2003/06/10-

176958 Ci 6554 TBq May 18, 2005

MDŚ Nordion

Science Advancing Health

Loading Chart for F168 Source Carrier

MDS Nordion

Voice: 613-592-3400 ext. 2524

447 March Road

Fax: 613-591-7423

Ottawa, Ontario, Canada K2K 1X8

www.mds.nordion.com



Science Advancing Health

To:

Mr. Luke Trauger

Date:

Thursday, June 02, 2005

Sender:

CFC Logistics Kevin O'Hara

Copy:

Terry Kehoe

Senior Radiation Physicist

Customer Quotation 2005118

Total # of pages including this page: 1

CFC Logistics, Quakertown, PA, USA - Irradiator Decommissioning Report

MDS Nordion has decommissioned CFC Logistics Category III Irradiator according to MDS Nordion internal procedure IN/OP 0165 Co60, 'Decommissioning Procedure for a Category IV Cobalt-60 Panoramic Wet Storage Gamma Irradiator'. The principles and philosophy of this procedure apply directly to a Category III irradiator.

All radiation sources were removed and returned to MDS Nordion. Eighty-two (82) sources totalling 938,300 Ci (as off 2004 Nov. 01) were shipped to MDS Nordion, which matches exactly with the number of sources that were in the irradiator.

The source rack and modules were wiped. All wipes were measured with a Bicron Surveyor 2000 pancake probe. All wipe contamination results indicated no detectable activity. Water samples were taken from the pool. All water samples were measured with a Multi-channel Analyzer. All water contamination results indicated no detectable activity. Resin samples were taken. All resin samples were measured with a Multi-channel Analyzer. All resin contamination results indicated no detectable activity.

Conclusion: All wipes, water and resin samples have been analyzed. All contamination results indicate no detectable activity. CFC Logistics Cat. III Irradiator, Quakertown, PA, USA is decommissioned. Since no detectable contamination was measured, CFC Logistics may choose to discharge the pool water into the sanitary sewage system (according to CFR 20.2003).

Sincerely.

Kevin O'Hara

Kevin P.J. O'Hara, Senior Radiation Physicist Ion Technologies Business Unit, MDS Nordion Inc.

Tel: (613) 592-3400 Ext 2524

Fax: (613) 591-7423

email: kohara@mds.nordion.com

www.mds.nordion.com

MDS Nordion - Applied Physics/Radiation Measurement CFC Logistics Decommissioning Report

ROUTINE WIPE TEST FOR CONTAMINATION AND LEAK TEST FORM
447 March Road, Kanata, Ontario, Canada K2K 1X8. Telephone: (613) 592-2790 Telefax: (613) 591-6815
Customer Information /
Order No. 200366 Customer' Name CFC Logistics
Customer's Location
Irradiator Type and Radiation Source Characteristics Note: Initial all boxes
Irradiator Type: (e.g. JS-8900, GC-3000) Serial Number M/A Radiation Source Type: 60 Control or 137 Cs
Wipe Test Details
Wipe Test Performed on: 1. Surface Tests 2. Source Tests
Surface of Transport Package Underwater Source
Category I & II Irradiators Ad Source Handling Tools
Plug and Cavity of Transport Package OTHER: Decumis ion of
(Specify) Plug and Cavity of Transport Package Gregorian Irraction
106
Description of Procedure Used: Initial One or more: J-Cloth Affilter Paper Styrofoam Other:
Initial One or more: Wet Wipe Dry Wipe Other:
Survey Meter Details and Measurement Results
Survey Meter Make and Model: Bicron Surveyor 2000, with Pancake Probe Other (Specify)
Survey Meter S.N.: C5981 Calibration Expiry Date: Oct 22/04
Pancake Probe S.N.: B 2666
Instrument Conversion Factor: Source Tests $ \begin{array}{cccccccccccccccccccccccccccccccccc$
Background Reading: 35 cpm (A) Gross Wipe Reading: cpm (B) Net Wipe Reading: cpm (C) = (B) - (A). Choose the calculation I, or II.
1. Surface Tests
Wipe Test Results: Regative. Contamination < 0.4 Bq/cm². No further action is required. Retain all wipes for further testing. □ Positive. Contamination ≥ 0.4 Bq/cm². Outline initial corrective action on this form. Follow relevant
SOP.
2. Source Tests
(I) Measured Removable Contamination = $\frac{\text{Net Wipe Reading (cpm) x 5 nCi}}{\text{cpm}} =\text{nCi Cobalt} - 60$
(II) Measured Removable Contamination = $\frac{\text{Net Wipe Reading (cpm) x 5 nCi}}{\text{cpm}} = _{} \text{nCi Cesium - 137}$
Wipe Test Results: ☐ Negative. Contamination < 5 nCi. No further action is required. Retain all wipes for further testing. ☐ Positive. Contamination ≥ 5 nCi. Outline initial corrective action on this form. Follow relevant SOP.

ROUTINE WIPE TEST FOR CONTAMINATION AND LEAK TEST FORM
Initial the MDS Nordion Wipe Test Procedure Followed
IN/IM 0273 Co60, Routine Wipe Test for the Detection of Radioactive Contamination for Submerged Cobalt 60 Source Assemblies
IN/OP 0274 F000, Underwater Transport Package Unload Procedure (requires a separate form)
IN/OP 0275 F000, Underwater Transport Package Load Procedure
☐ IN/OP 0276 CO60. Source Holder Load Procedure for a Wet Storage Irradiator
IN/IM 0278 A000, Routine Wipe Test for ANSI Category I and II Irradiators (60Co and 137Cs)
☐ IN/OP 0282 F168, Procedure for the Receipt of an F-168 Transport Package
☐ IN/IM 0293 F000. Routine Wipe Test for the Detection of Radioactive Surface Contamination for a Type B(U) Transport Package
Reference Information Documents
1. IN/DS 0277 IR000. Radiation Survey Specification for Category III and IV Irradiators
2. IN/DS 0517 F168, Preparation for Shipment of the F-168 and F168-X Transport Packagings
3. IN/DS 1093 Z000, Information Document on Survey Meters use by MDS Nordion's Installation and Service Group
4. SE-CA-006, Calibration of a Detection System for the Measurement of Loose Contamination on Swipe
Standard Operating Procedure List and Proper Usage
1. Handling Tools Work Table - IN/IM 0273 Co 60
2. Source Rack - IN/IM 0273 Co 60
3. Building Survey - IN/DS 0277 IR000
4. Leak Test - IN/OP 0282 F168
5. Shipping Container and Inner Plug - IN/IM 0293 F000
6. Torque Specs and Return of Sources Procedure - IN/DS 0517 F168
Outline Initial Corrective Action (if required):
Corrective Action Taken by(Name)(Signature)
Corrective Action Performed on(Date)
Wipe Test Performed by and Result Certified by A Call & Blame) (Senature)
Service Kep (Title) //oj (14/05 (Date)
For MDS Nordion Internal Use Only
Measurement Result Confirmed by R. G. Duvch Name) W. Uu Signature)
10 May 105

447 March Road, Kanata, Ontario, Canada K2K 1X8. Telephone: (613) 592-2790 Telefax: (613) 591-6815								
Customer Information Order No. 200366 Customer' Name CFC Logistics Customer's Location								
Irradiator Type and Radiation Source Characteristics Note: Initial all boxes Radiation Source Type: 60 C 3000) Serial Number Radiation Source Type: 60 C 3000 or 137 Cs								
Wipe Test Details Wipe Test Performed on: Surface Tests Surface of Transport Package Category I & II Irradiators 2. Source Tests Underwater Source Source Handling Tools								
Plug and Cavity of Transport Package								
Survey Meter Details and Measurement Results Survey Meter Make and Model: Bicron Surveyor 2000, with Pancake Probe Other (Specify) Survey Meter S.N.: C598E Calibration Expiry Date: Oct 22/04 Pancake Probe S.N.: 13 2666								
Instrument Conversion Factor: Source Tests $cpm = 5 \text{ nCi } (185 \text{ Bq}) \text{ for } ^{60}\text{Co} (\text{see SE-CA-006 F1}). \text{ or } \\ cpm = 5 \text{ nCi } (185 \text{ Bq}) \text{ for } ^{137} \text{ Cs} (\text{see SE-CA-006 F1})$								
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MDS Nordion Telephone: 613 592-2790 447 March Road Fax: 613 592-6815 Ottawa Ontario Canada K2K 1X8



Fax Transmission

To:

Luke Trauger

CFC Logistics

Sender:

Company:

Dan Aitkenhead

Subject:

Certificates

Fax:

1-215-529-9512

June 7, 2005

Date: Copy:

Total # of pages including this

page:

5

Dear Luke,

Here are the certificates you requested.

If you need anything else please call me at 1-800-465-3666 ext. 2290

Regards,

Dan Aitkenhead Sales Support MDS Nordion

ROUTINE WIPE TEST FOR CONTAMINATION AND LEAK TEST FORM
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☐ IN/IM 0278 A000, Routine Wipe Test for ANSI Category I and II Irradiators (⁶⁰ Co and ¹³⁷ Cs)
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4. Leak Test - IN/OP 0282 F168
5. Shipping Container and Inner Plug - IN/IM 0293 F000
6. Torque Specs and Return of Sources Procedure - IN/DS 0517 F168
Outline Initial Corrective Action (if required):
Corrective Action Taken by(Name)(Signature)
Corrective Action Performed on(Date)
Wipe Test Performed by and Result Certified by Color (Signature)
Service Kep (Title) May 18/05 (Date)
For MDS Nordion Internal Use Only
Measurement Result Confirmed by K.G.Duvchv (Name) X.L.U. Signature)
MEASUREMENT RESULT CONFIRMED ON 8 (DATE)

447 March Road Ostawa, ON K2K IX8 Canada Tel: +1 613 592 2790 Fax: +1 613 592 6937 www.mds.nordion.com



Science Advancing Health

CERTIFICATE

OF

CALIBRATION

	ION TECH (25M-70)
SURVEY METER: Bica au	MODEL: SURVEY OR RECEIVED NO.: C 5986
ANCAKE DETECTOR: BICRON	MODEL: PGM SERIAL NO.: B2664
ALIBRATION SOURCES:	
/32	Bq 137Cs on20 04
89	Bq 50Co on 0c722 20 04
ALIBRATION GEOMETRY: SOUR	RCE TO FRONT FACE OF DETECTOR = 1 cm.
CONVERSION FACTOR:	
1. <u>/360</u> CPM = 185	35 Bq (5nCi) OF 137 Cs or Efficiency = $\frac{12 \cdot 2}{}$ %
2. <u>825</u> CPM = 186	35 Bq (5nCi) OF 60Co or Efficiency = 7.4 %
\wedge	35 Bq (5nCi) OF ⁶⁰ Co or Efficiency = <u>7 4</u> % y of the measurement is within ± 20%
The accuracy	y of the measurement is within ± 20%
\wedge	



117 March Road Ottawa, ON K2K 1X8 Tel: +1 613 592 2790 Fax: +1 613 592 6937 www.mds.nordion.com



Science Advancing Health

CERTIFICATE OF CALIBRATION

WNER: UDS)	MORDION	LOI -	TECH .	(RSM - 70)
NSTRUMENT MAKE: T	BICKON	MODEL: SUR	JEYAR ZEOC		
ETECTOR TYPE:	☐ ION CHAM	BER 🔁 G.I	M.	PROBE NO:	C858E
CALIBRATION SOURCE	NOM (AAL)	¹⁹⁷ Cs_ <u>89.28mF</u>	どかの 1 meter on	<u>্</u> যুত	L 1 20©
ALIBRATION GEOMET	<u> </u>		⊠ ===		
IF APPILICABLE)	TEMPERATUR PRESSURE HUMIDITY	RE: Wa			
BATTERY CHECK HIGH VOLTAGE CH	ECK [<u>.</u>			
		atio: Expected Exp	posure Rate posure Rate		
ALARM CHECK		etio; Expected Ex	posure Rate		
ALARM CHECK		atio: Expected Exp	posure Rate	50/150	500
ALARM CHECK NOTE: The calibrati	ion factor is the n	etio: Expected Exposured Exposure I	SATE (mR/h) 5.0/15 5.0/14.7	57/142	500 490
ALARM CHECK NOTE: The calibrate EXPECTED OBSERVED CAL FACTOR	ion factor is the n	etio: Expected Exposure I	RATE (mR/h)	57/142	490
ALARM CHECK NOTE: The calibration EXPECTED OBSERVED	ion factor is the n	etio: Expected Exp Observed Exp EXPOSURE I O.S/ 1.S G.S/ 1.S	SATE (mR/h) 5.0/15 5.0/14.7	57/142	490
EXPECTED OBSERVED CAL FACTOR RANGE USED	ion factor is the n	Expected Exposure I Observed Exposure I O.S/ 1.S O.S/ 1.S	SATE (mR/h) 5.0/15 5.0/14.7 1.0/1.02 × 10 DATE: OCT	57/142 0.88/1.06 × 100 22/200	490 1.02 ×1200
ALARM CHECK NOTE: The calibration EXPECTED OBSERVED CAL FACTOR RANGE USED ALIBRATION BY JTHORIZATION:	ion factor is the n	etio: Expected Exp Observed Exp EXPOSURE I O.S/1.S O.S/1.S 1.3/1.0 × 1	S. 0 / 15 S. 0 / 14.7 1.0 / 1.02 DATE: OCT DATE: O C+	57/142 0.88/1.06 × 100 22/200 - 25,200	490 1.02 ×1=00
EXPECTED OBSERVED CAL FACTOR RANGE USED UTHORIZATION:	ion factor is the n	Expected Exposure I Observed Exposure I O.S/ 1.S O.S/ 1.S 1.0/1.0 × 1	SATE (mR/h) 5.0/15 5.0/14.7 1.0/1.02 × 10 DATE: OCT	57/142 0.88/1.06 × 100 22/200 - 25,200	490 1.02 ×1=00

SE-CA-002 F1 (4)





Science Advancing Health

INSTRUMENT EFFICIENCY CHECK RECORD

SCALER/CRM:

cpm

Date:

01-Nov-04

HIGH VOLTAGE:

900 V

MODEL: SURVEYOR SERIAL:

C598E

2000

PROBE MAKE:

BICRON

MODEL:

PGM

SERIAL:

B266G

UNIT ID:

RSM 70

INSTRUMENT MAKE: BICRON

DATE	TEST SOURCE	EPM2PI	OBS CPM	PRE SERVICEN	VERFENDWERE
1-Nov-04	.CO-60.	23,927.80	5,500.00	35	11.42
1-Nov-04	CS-137	6,086.65	1,800.00	35	14.50
1-Nov-04	U-298	8,532.00	3,500.00	35	41

Efficiency check geometry:

Expected CO-60=16%

Source to detector tace = 0.5 cm

values

CS-37=18%

U+238= 60%

EFF/CPM Conversion for 185 Bq (5 nCi)

TEMP:

 $\mathbf{C}_{\mathbf{0}}$

CO-60:

984.81

CPM

R.H.:

C\$-137:

1,656.72

CPM

(IR-192)

U-238:

4,553.45

CPM

Comments:

The efficiency check is within acceptable limits.

Check conducted by: C.D. Beatty

Signature

Date: 1-Nov-04

ource Dete

Cobattor Source Hel 775, 75-890 Gulasvinin/api ac of al-Kniglos

Allen 197 Seur al EGG (97 E 872 beleen mit 2p av al 25 ag yei

Frankfurt 208 Squite # KK-429, \$ 532 EFM as of 15 Mar 97

CFC LOGISTICS DE-COMMISSON Jun/7/2005 7:00:47AM

HEADER INFORMATION in BKR10133 SO

Identification	Acquisition		
User : G Chupick	Started	:	May/31/2005 4:11:41PM
MCArd : 1	Stopped	:	May/31/2005 4:45:02PM
Detector : MCA #2	True Time	:	2000.249 sec
Geometry : 1 Litre Beaker	Live Time	:	2000.000 sec
Sample : 1	Dead Time	;	0.01 %
Channels: 8192	Gross Count	:	6759 counts
			1.0000005
	Gross Rate	:	3,3795 cps

Sampled from May/31/2005 4:45:06PM to May/31/2005 4:11:41PM

Energy Calibration May/19/2005 8:37:41AM BKR10096.S0 Resolution Calibration Jul/18/2003 2:47:43PM BKR07543.S0 Efficiency Calibration Aug/6/2003 3:20:01PM BKR08066.S0 Isotope Library NORDION.LIB Aug/12/2002 11:30:02AM

ROI STATISTICS INFORMATION in BKR10133.50

ROI	Error	Centroid keV	FWHM keV	FWTM keV	FWTM/FWHM ratio	H/L ratio
1	2000.00 %	661.68				
2	2000.00 %	724.22				
3	2000.00 %	756.73				
4	66.67 %	764.67	0.25	3.92	15.80	8.900/6.900
5	103.07 %	1172.89	0.27	2.13	7,90	4.936/3.633
6	37.80 %	1332.39	0.66	1.97	2.98	2,848/5.102

Errors Quoted at 2 Sigma

ACTIVITY INFORMATION for BKR10133.S0

Name	Energy keV	Activity Flag nCi		Error nCi
Co-60 Co-60 Weighted	1173.23 1332.51 Average	* <	0.03010 0.04604 0.04604	± 0.0008412 ± 0.01745 ± 0.01745
Cs-137	661.62	* <	0.02221	± 0.0005087
Nb-95	765.82	*	0.009194	± 0.006134
Zr-95 Zr-95	724.18 756.72	* < * <	0.04746 0.04751	± 0.001121 ± 0.001139
Grand To	tal	(0.05523	± 0.0185

Activity (nCi) at May/31/2005 4:11:41PM

Errors Quoted at 2 Sigma MDA's Quoted at 1.645 Sigma

Flags Meaning

Forced MDA from identification

MDA value

RSO, Inc. Report of Sample Analysis

Job: CFC Logistics Irradiation

Job No.: 2005-554

Sample Analysis: HPGe Gamma Spectroscopy

Equipment: RSO HPGe

Canberra Genie 2000

Spectroscopy Software

Analysis Date(s): 5/31/2005

Report Date: 5/31/2005

Sample ID	Time	Campala			Co-60	
Sample ID		Sample	Sample	Activity Concentration	MDC	
Sample ID		Size	Matrix	pCi/g	pCi/g	Comment
Water Filter #1	15	687 g	Filter	< MDC	0.10	
vato. Titor ir	1	(Dry Weight)	,		0.70	
Water Filter #2	15	617 g	Filter	< MDC	0.01	
		(Dry Weight)				
Water Filter #3	15	221 g	Filter	< MDC	0.23	
		(Dry Weight)				
Air Filter Red	15	27 g	Filter	< MDC	1.70	
Air Filter Brown	15	53 g	Filter	< MDC	0.67	
		<u> </u>				
	Water Filter #3 Air Filter Red	Water Filter #2 15 Water Filter #3 15 Air Filter Red 15	(Dry Weight) Water Filter #2 15 617 g (Dry Weight) Water Filter #3 15 221 g (Dry Weight) Air Filter Red 15 27 g	(Dry Weight)	(Dry Weight) Water Filter #2 15 617 g Filter < MDC	(Dry Weight) Water Filter #2 15 617 g Filter < MDC 0.01

Error term shown is counting error only at the 2 sigma confidence level.

Prepared by:

Signature David Bisson, Manager Radiation Safety Services

7/ 03

Date

Reviewed by:

Signature

Date

te

Att David Bissen

RSO, Inc. CHAIN OF CUSTODY / SAMPLE INFORMATION FORM 5204 Minnick Road • Laurel, Maryland 20707 • 301-953-2482 • 410-792-7444 • FAX 301-498-3017								
NAME: Like Tranger/CFC Longistics CONTRACT/P.O. NUMBER: 61345								(LAB USE CNLY) LAB CONTROL #:
Guake Low PA 18951 CONTACT: 1 To				PROJECT NAME/#	Decom	REVIEWED BY: SAMPLER:		
	-529-9522 FAX:	<u> </u>	-95/2	COMMENTS.				X. Iz
SAMPLE ID	SAMPLE LOCATION	MATRIX	CONTAIN	IER DESCRIPTION	# of CONTAINERS	DATE	TIME	ANALYSIS REQUIRED/COMMENTS
<i>i</i>	Water filter 1							San do: (0-60
2	water filter 2						-	1,
3	water fitter 3							И
4	Air Filter Red							v
5	Air Lilter Bro.	n) '
								п
,								
						· · · · · · · · · · · · · · · · · · ·		
TRANSFERRED BY: RECEI			RECEIVE	mmors a	RSO INC	DATE 5/23/05	TIME /0:05	REMARKS:
TRANSFERF	RED BY:		RECEIVE	RECEIVED BY: DATE TIME				
TRANSFERF	RED BY:	·	RECEIVE	D BY:		DATE	TIME	



Radiation Service Organization

June 6, 2005

Luke Trauger CFC Logistics 4000 AM Drive Quakertown, PA 18951

Re: Gamma Spectrum Analysis of Air and Water Filters

Dear Mr. Trauger,

RSO is please to provide you with the gamma spectrum analysis for the filter samples that was received by our lab on 5/23/05 (RSO job number 2005-554).

Method

The gamma spectrum analysis was conducted by using RSO's high purity germanium counting system. A NIST traceable mixed gamma standard in a 500-ml marinelli beaker configuration was used for both the energy and efficiency calibration of the counting system. Each filter was placed directly on top of the detector and a 15 minute gamma spectrum was collected. The gamma spectrum was analyzed by using Canberra Genie 2000 spectroscopy software and was compared to a library comprised of naturally occurring isotopes and other common isotopes (which included Co-60).

Results

See enclosed report of sample analysis.

Conclusions

In all five spectrums, no gamma lines were identified. For each spectrum, the Genie 2000 spectroscopy software calculated the minimum detectable concentration (MDC) values for each isotope in the library using the spectral data for each sample and the efficiency calibration. The Co-60 MDCs were reported on the enclosed analysis report. These sample results could be used as an indirect leak test. The results should provide reasonable assurance that none of the Co-60 sources had leaked any more than 0.005 uCi out of the system. This assurance can be based on the sensitivity of this analysis reflected in the MDCs, the volume of air or water that passed through the filters and the efficiency of the filters for collection of Co-60 contaminants. Since the activity concentrations in all five sample were below the stated MDC values, the total activates in each would be at least an order of magnitude less that the 0.005 uCi leak test limit.

Thank you for this opportunity to be of service. If you have any questions please do not hesitate to contact me.

Sincerely,

David Bisson, CHP

Manager, Radiation Safety Services

Enclosures

DB

P.O. Box 1450, Laurel, Maryland 20725-1450

Washington (301) 953-2482

Fax (301) 498-3017

Baltimore (410) 792-7444

Irradiator Decommissioning Survey

Meter Model # 3 Meter SN /93879 Calibration Date: 3/2/05 Background Reading: 0.0 Name:	1 maple
A - H: Pool Rim I – P: Pool Bottom	All Readings in mither.
	F 0.01 E 0.01
0,01 G 0,01 G	D 0.01
O.01 H	C C K O.0/
	A 0.01 B 0.01
	Controller

RSO, Inc. P.O. Box 1450 Laurel, MD 20725 (301) 953-2482

Certificate of Calibration

INSTRUMENT: LUDLUM

MODEL: 3
TYPE: RATEMETER SN: 193879

RSO Job No. 5577

ISSUED TO: CFC Logistics 4000 AM Drive

Quakertown, PA 18951

CONTACT: Luke Trauger PHONE: (215) 529-9512

PO NO:

RSO, Inc. certifies that on 03/07/2005 the above described instrument was calibrated in a known radiation field using 137 Cs (662 keV) beam calibrator (J.L. Shepherd Model 28-6A, S/N 10056). Electronically pulsed using Ludlum 500,S/N 24781.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data

RANGE	EXPECTED	OBSERVED	C.F.	
0.1	0.05 0.15			
1	0.6			
10	5 15			
100	50 150			
	0.1 1 10	0.1 0.05 0.15 1 0.6 1.5 10 5 15	0.1 0.05 0.05 * mR/t 0.15 0.15 * mR/t 1 0.6 0.6 mR/t 1.5 1.5 mR/t 10 5 5 5 mR/t 15 15 mR/t 100 50 46 mR/t	

1.01 C.F. AVERAGE

· Electronically pulsed.

Probe type(s) Probe1: SWGM

Probe2:

Probe3:

GEOMETRY VOLT ISOTOPE 1 EFF.(%) ISOTOPE 2 EFF.(%) ISOTOPE 3 EFF.(%) ISOTOPE 4 EFF.(%) MODEL WINDOW SER#

PR198897 CLOSED 44-38 900 PERPEND.

INSTRUMENT CHECKS

ENVIRONMENTAL

1 mR/hr CHECK: N/A BATTERY CHECK: NORMAL CHECK SOURCE 1: N/A READING: **CHECK SOURCE 2: N/A** READING:

TEMP: 20 °C PRESS: 754 mmHg HUMID: 38 %

RECALIBRATION DATE FOR THIS INSTRUMENT IS 03/07/2006

Calibrated By: 6 Reviewed By:

Cal Date: 03/07/2005

Maryland License MD-33-021-01

11629