RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 1074121299-0

Customer: .
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Victoreen Model 451B

Serial Number
1074

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
108.00 mR/hr	108.00 mR/hr	110.00 mR/hr	108.67 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	36 R/hr	36 R/hr
Rate	10 R/hr	10.4 R/hr	10.4 R/hr
Rate	4 R/hr	4.1 R/hr	4.1 R/hr
Rate	1 R/hr	1.06 R/hr	1.06 R/hr
Rate	400 mR/hr	410 mR/hr	410 mR/hr
Rate	100 mR/hr	108 mR/hr	108 mR/hr
Rate	40 mR/hr	43 mR/hr	43 mR/hr
Rate	10 mR/hr	10.4 mR/hr	10.4 mR/hr
Rate	4 mR/hr	4.2 mR/hr	4.2 mR/hr
Rate	1 mR/hr	0.97 mR/hr	0.97 mR/hr
Integrate	200 mR	200 mR	200 mR
Integrate	50 mR	53 mR	53 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Internal Check: *Pass*
Tap Test: *Pass*
Desiccant Check: *Pass*

Comments: All readings higher than 4 mR/hr were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1110).

Argo Banerjee
Calibration Technician

QA Review:

Calibration Date: 05/09/2018
Expires: 05/09/2019

Atmospheric Conditions - Temperature: 71°F Humidity: 35% Barometric Pressure: 30.17"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R.
RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.
Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994
RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2005 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.
This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc.

Radiation Safety and Control Services, Inc.
91 Portsmouth Ave. Stratham, NH 03885
1-800-525-8339 (603) 778-2871 Fax (603) 778-6879
www.radsafety.com

ANAB ACCREDITED ACCREDITED CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 3096117960-0

Customer: .
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Fluke Biomedical Model 451P

Serial Number
3096

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
10.30 mR/hr	10.30 mR/hr	10.40 mR/hr	10.33 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	4 R/hr	3.6 R/hr	3.6 R/hr
Rate	1 R/hr	0.9 R/hr	0.9 R/hr
Rate	400 mR/hr	370 mR/hr	370 mR/hr
Rate	100 mR/hr	96 mR/hr	96 mR/hr
Rate	40 mR/hr	40 mR/hr	40 mR/hr
Rate	10 mR/hr	10.3 mR/hr	10.3 mR/hr
Rate	4 mR/hr	3.6 mR/hr	3.6 mR/hr
Rate	1 mR/hr	0.95 mR/hr	0.95 mR/hr
Rate	400 µR/hr	345 µR/hr	365 µR/hr
Rate	100 µR/hr	92 µR/hr	103 µR/hr
Integrate	80 mR	78 mR	78 mR
Integrate	20 mR	18.9 mR	18.9 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Internal Check: *Pass* Tap Test: *Pass*

Comments: All readings higher than 4 mR/hr were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100).
As Found/As Left Calibration Factors: F1 = 97/107 F2 = 115/115 F3 = 110/110 F4 = 100/100 F5 = 92/92 F6 = 100/100 / 100/100

Argo Banerjee
Calibration
Technician

QA
Review:

Calibration Date: 01/30/2018
Expires: 01/30/2019

Atmospheric Conditions - Temperature: 71°F Humidity: 21% Barometric Pressure: 29.82"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R.
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ANAB ACCREDITED CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 3869116896-0

Customer:
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Victoreen Model 451P

Serial Number
3869

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
9.90 mR/hr	9.90 mR/hr	9.90 mR/hr	9.90 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	4 R/hr	3.9 R/hr	3.9 R/hr
Rate	1 R/hr	0.96 R/hr	0.96 R/hr
Rate	400 mR/hr	360 mR/hr	360 mR/hr
Rate	100 mR/hr	99 mR/hr	99 mR/hr
Rate	40 mR/hr	39 mR/hr	39 mR/hr
Rate	10 mR/hr	9.9 mR/hr	9.9 mR/hr
Rate	4 mR/hr	3.7 mR/hr	3.7 mR/hr
Rate	1 mR/hr	0.94 mR/hr	0.94 mR/hr
Rate	400 µR/hr	365 µR/hr	365 µR/hr
Rate	100 µR/hr	107 µR/hr	107 µR/hr
Integrate	80 mR	81 mR	81 mR
Integrate	20 mR	19.7 mR	19.7 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Internal Check: *Pass* Tap Test: *Pass*

Comments: All readings 10 mR/hr or higher were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100).

Mark Nelson
Calibration
Technician

QA
Review:

Calibration Date: 01/03/2018
Expires: 01/03/2019

Atmospheric Conditions - Temperature: 70°F Humidity: 20% Barometric Pressure: 30.12"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R.
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Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994
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ANAB ACCREDITED CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 452112009-0

Customer:
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Victoreen Model 451B

Serial Number
452

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
37.00 mR/hr	37.00 mR/hr	38.00 mR/hr	37.33 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	38 R/hr	38 R/hr
Rate	10 R/hr	11 R/hr	11 R/hr
Rate	4 R/hr	4.1 R/hr	4.1 R/hr
Rate	1 R/hr	1.08 R/hr	1.08 R/hr
Rate	400 mR/hr	400 mR/hr	400 mR/hr
Rate	100 mR/hr	105 mR/hr	105 mR/hr
Rate	40 mR/hr	37 mR/hr	37 mR/hr
Rate	10 mR/hr	9.8 mR/hr	9.8 mR/hr
Rate	4 mR/hr	3.9 mR/hr	3.9 mR/hr
Rate	1 mR/hr	1.02 mR/hr	1.02 mR/hr
Integrate	200 mR	210 mR	210 mR
Integrate	50 mR	54 mR	54 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Tap Test: *Pass*
Desiccant Check: *Pass*

Comments: All readings higher than 1000 mR/hr were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100). Dried/replaced desiccant.

Chris Pirie
Calibration
Technician

QA
Review:

Calibration Date: 07/25/2017
Expires: 07/25/2018

Atmospheric Conditions - Temperature: 74°F Humidity: 43% Barometric Pressure: 29.93"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R.
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ANAB ACCREDITED ISO/IEC 17025 CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 799113566-0

Customer:
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
InoVision Model 451B

Serial Number
799

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
4.00 mR/hr	4.00 mR/hr	3.90 mR/hr	3.97 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	38 R/hr	38 R/hr
Rate	10 R/hr	10.8 R/hr	10.8 R/hr
Rate	4 R/hr	4.1 R/hr	4.1 R/hr
Rate	1 R/hr	1.07 R/hr	1.07 R/hr
Rate	400 mR/hr	430 mR/hr	430 mR/hr
Rate	100 mR/hr	105 mR/hr	105 mR/hr
Rate	40 mR/hr	39 mR/hr	39 mR/hr
Rate	10 mR/hr	10.3 mR/hr	10.3 mR/hr
Rate	4 mR/hr	4 mR/hr	4 mR/hr
Rate	1 mR/hr	1.1 mR/hr	1.1 mR/hr
Integrate	200 mR	200 mR	200 mR
Integrate	50 mR	51 mR	51 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Internal Check: *Pass*
Tap Test: *Pass*
Desiccant Check: *Pass*

Comments: All readings higher than 4 mR/hr and the integrate readings were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100).

Mark Nelson
Calibration Technician

QA Review:

Calibration Date: 08/31/2017
Expires: 08/31/2018

Atmospheric Conditions - Temperature: 75°F Humidity: 41% Barometric Pressure: 29.69"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
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ANAB ACCREDITED CALIBRATION LABORATORY

ALPHALAB INC.

Model GM2
Serial #2895

Recalibration Certificate

This Gaussmeter Model GM2 #2895 was recalibrated on 03/15/17 by Tarik Dzumhur. This gaussmeter was reading 101.97% of correct and was adjusted to 100% correct +/- 0.2% at 70°F on 03/15/17. This accuracy level complies with the published +/-2% accuracy.

This AlphaLab, Inc. GM2 is certified to display magnetic flux density in one axis with a scaling inaccuracy of ± 2% (of reading) over the temperature range of -4°C to 65°C (25° F to 149° F) and 0-80% RH in the dynamic range of 0 to ± 20kG and ± 3% (of reading) in the 20kG – 30kG range. Accuracy of absolute zero field level is determined by the user when setting the "OFFSET" control. The linearity over the ± 20kG range is ± 0.2% and less than ± 1% over the 20kG to 30kG range. AC accuracy is +/-3% of reading from 45Hz to 800Hz (pseudo RMS AC).

Calibration with ST Probes was performed using Magnetic Instrumentation Inc. gap magnet model # F062-10K serial #901298-1 as the primary standard. Calibration with HS Probes was performed by a Helmholtz coil with calibrated field strength, traceable to NIST or to natural physical constants. Verification of the coil field strength is performed at least once every six months by direct measurement of lengths and electrical current. The current measurement in the Helmholtz coil was done with an Extech Instruments Model 560A Multimeter, serial #Z335975. The Helmholtz dimensions were measured using a Mitutoyo 500-321 Digimatic Caliper, serial #7043458. Calibration of the multimeter and the caliper were done using ISO/IEC 17025:2005 and ANSI/NCSL Z540-1-1994 traceable to NIST standards and is current and performed annually. Uncertainty of the standards is less than +/-.2%, so the TAR is greater than 4:1.

Ambient conditions during calibration were temperature 23° ± 1°C, RH 40% ± 5%.

Certification performed for:
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

This certificate of calibration is valid for one year.

Calibration performed by:

Tarik Dzumhur

MAR 15 2017

Tarik Dzumhur Date

3005 South 300 West, Salt Lake City, UT 84115 www.trifield.com mail@trifield.com tel +1 801.487.9492 fax +1 801.487.3877

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 25006598107373-0

Customer: .
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Ludlum Model 9DP-1

Serial Number
25006598

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
410.00 mR/hr	420.00 mR/hr	410.00 mR/hr	413.33 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
X10K	40 R/hr	38 R/hr	38 R/hr
X10K	10 R/hr	10 R/hr	10 R/hr
X1K	4 R/hr	4.17 R/hr	4.17 R/hr
X1K	1 R/hr	1.04 R/hr	1.04 R/hr
X100	400 mR/hr	410 mR/hr	410 mR/hr
X100	100 mR/hr	91.9 mR/hr	91.9 mR/hr
X10	40 mR/hr	43.5 mR/hr	43.5 mR/hr
X10	10 mR/hr	10.1 mR/hr	10.1 mR/hr
X1	4 mR/hr	3.96 mR/hr	3.96 mR/hr
X1	1 mR/hr	1.05 mR/hr	1.05 mR/hr

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Tap Test: *Pass*

Comments: All readings higher than 100 mR/hr were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100).

Chris Pirie
Calibration
Technician

QA
Review:

Calibration Date: 03/01/2017
Expires: 03/01/2018

Atmospheric Conditions - Temperature: 71°F Humidity: 31% Barometric Pressure: 29.62"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
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www.radsafety.com

ANAB ACCREDITED CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 1074107374-0

Customer: .
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Victoreen Model 451B

Serial Number
1074

Precision Check				
Test 1	Test 2	Test 3	Mean	Results
110.00 mR/hr	110.00 mR/hr	109.00 mR/hr	109.67 mR/hr	Satisfactory

Accuracy Check			
Range	Target Value	As Found	As Left
Rate	40 R/hr	39 R/hr	36 R/hr
Rate	10 R/hr	11.5 R/hr	10.5 R/hr
Rate	4 R/hr	4.0 R/hr	4.0 R/hr
Rate	1 R/hr	1.07 R/hr	1.07 R/hr
Rate	400 mR/hr	420 mR/hr	420 mR/hr
Rate	100 mR/hr	110 mR/hr	110 mR/hr
Rate	40 mR/hr	40 mR/hr	40 mR/hr
Rate	10 mR/hr	10.4 mR/hr	10.4 mR/hr
Rate	4 mR/hr	4.3 mR/hr	4.3 mR/hr
Rate	1 mR/hr	1.03 mR/hr	1.03 mR/hr
Integrate	200 mR	200 mR	200 mR
Integrate	50 mR	50 mR	50 mR

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value

Outer Physical Check: *Pass*
Internal Check: *Pass*
Tap Test: *Pass*
Desiccant Check: *Pass*

Comments: All readings higher than 100 mR/hr were obtained using the J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N: 9141). All other readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100). As-Found/As-Left Calibration Factors: F1 = 96/96, F2 = 93/93, F3 = 105/105, F4 = 99/99, F5 = 100/92, INT = 100/100.

Mark Nelson
Calibration
Technician

QA
Review:

Calibration Date: 02/28/2017
Expires: 02/28/2018

Atmospheric Conditions - Temperature: 71°F Humidity: 28% Barometric Pressure: 30.27"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%
Unless otherwise stated, calibrations performed in conformance to the following documents: ANSI N323AB-2013; RSCS New Hampshire Radioactive Material License Number 381R.
RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedures.
Calibration Laboratory is operated in accordance with ANSI/NCSL Z540-1-1994
RSCS, Inc. has been assessed by ANAB and meets the requirements of ISO/IEC 17025:2005 while demonstrating technical competence in the field of calibration. Refer to the Scope of Accreditation AC-2079 for information on the types of calibrations to which this accreditation applies.
This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc.

Radiation Safety and Control Services, Inc.
91 Portsmouth Ave. Stratham, NH 03885
1-800-525-8339 (603) 778-2871 Fax (603) 778-6879
www.radsafety.com

ANAB ACCREDITED CALIBRATION LABORATORY

RSCS
Radiation Safety & Control Services

Calibration Certificate
ID Number: 264306109087-0

Customer: Joe Greco
Upstate Medical Physics
1290 Blossom Drive
Victor, NY 14564

Instrument
Ludlum Model 3-241R

Serial Number
264306

Probe Model
Ludlum 44-9

Serial Number
283689

Precision Check

Test 1	Test 2	Test 3	Mean	Results
4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	4.00 mR/hr	Satisfactory

Accuracy Check

Range	Target Value	As Found	As Left
X100	160 mR/Hr	150 mR/Hr	145 mR/Hr
X100	40 mR/Hr	45 mR/Hr	40 mR/Hr
X10	16 mR/Hr	17.5 mR/Hr	16.5 mR/Hr
X10	4 mR/Hr	4.5 mR/Hr	4 mR/Hr
X1	1.6 mR/Hr	1.65 mR/Hr	1.65 mR/Hr
X1	0.4 mR/Hr	0.4 mR/Hr	0.4 mR/Hr
X.1	0.16 mR/Hr	0.165 mR/Hr #	0.165 mR/Hr #
X.1	0.04 mR/Hr	0.04 mR/Hr #	0.04 mR/Hr #

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value
Readings with # indicate ranges where pulser was used.

Probe Model & SN	Isotope	Efficiency	NIST Source ID	Geometry
44-9 283689	Tc-99m	0.0012 C/D	Co-57 (SN: 1693-28-1)	@1cm

MTE Instrument Type	Model	CalDueDate
Pulser	Ludlum 500-4 SN: 66151	12/14/2017

Outer Physical Check: *Pass*
Internal Check: *Pass*
Geotropism Check: *Pass*
Mechanical Zero: *Pass*
Tap Test: *Pass*

Electronics Checks	As Found	As Left
High Voltage	**900 Volts**	**900 Volts**

Comments: Unless indicated with a "#" in the table above to indicate a pulser was used, all readings were obtained using the Tech Ops Model 773 Cs-137 Beam Calibrator (S/N: S-1100).

Patrick Cashman
Calibration Technician

QA Review:

Calibration Date: 04/14/2017
Expires: 04/14/2018

Atmospheric Conditions - Temperature: 73°F Humidity: 30% Barometric Pressure: 30.37"hg

This calibration was performed by RSCS using one or more of the following NIST Traceable radiation sources:
Tech Ops Model 773 Cs-137 Beam Calibrator (S/N S-1110), characterized using Exradin Model A6 (S/N 185) and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-008, with estimated uncertainty of 6.0%.
J.L. Shepherd and Associates Model 89 Cs-137 Box Calibrator (S/N 9141), characterized using Exradin, Model A6 (S/N 185), A3 (S/N 197), A12 (S/N XA091124), and Keithley Electrometer Model 617 (S/N 0547677) in accordance with methods specified in RSCS TSD 11-001, with estimated uncertainty of 2.7%.
RSCS Neutron Calibrator, AmBe Source Model NUMEC-AM-31 (S/N Am-478), characterized using Far West Technologies Model FWAD-1 "HAWK" TEPC (S/N 021) in accordance with the methods specified in RSCS TSD 13-002, with estimated uncertainty of 9.4%
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