



INDIANA UNIVERSITY

SCHOOL OF MEDICINE

EVANSVILLE CENTER FOR MEDICAL EDUCATION  
8600 University Boulevard  
Evansville, Indiana 47712  
(812) 464-1831

DOD/DEB

December 17, 1990

Nuclear Materials Safety  
Section 1  
ATTN: William H. Schultz, Chief  
Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

13-15734-01

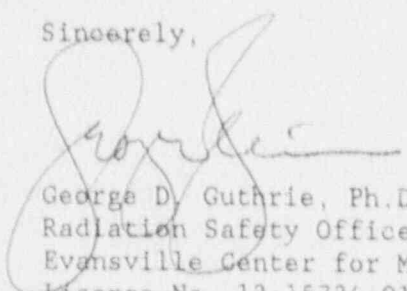
Dear Mr. Schultz:

I am writing in response to your recent request for a written statement or explanation regarding our negligence to comply with annual calibration of the survey meters in our operation. According to our records the calibration was completed for survey meter Serial No. 1002 in January 1986, March 1989, and February 1990. We also have records indicating the calibration was done on survey meter Serial No. 2134 in January 1986, May 1989, and March 1990. (See attached photocopies). These records would show that due to an oversight, the calibration was not completed on the survey meters in 1987 & 1988, but since that time a calibration schedule has been developed as part of our internal auditing system.

In addition to being included in the secretary's manual for our office, a new system of using a monthly calendar to denote specific NRC responsibilities has been initiated. Between the two documents, we feel a check system has been established. The citation for the violation will also serve as a reminder.

We understand the importance of the regulation in regards to handling radioactive materials and appreciate your concern. We will gladly supply further information if needed.

Sincerely,

  
George D. Guthrie, Ph.D.  
Radiation Safety Officer  
Evansville Center for Medical Education  
License No. 13-15734-01

DEC 20 1990

9101030260 901217  
REG3 LIC30  
13-15734-01 PDR

IE07

CERTIFICATION OF CALIBRATION - GAMMA SURVEY INSTRUMENTS

Calibration Date: January 12, 1986  
 Instrument Identification: Evansville Center for Nuclear Education City/State: Evansville, IN  
 G-M  Ion Chamber  Other \_\_\_\_\_ Model No. G.M.-2  
 Manufacturer: John H. Johnson Serial No. 1102  
 Calibration Source: 25000  
 Radionuclide: Cs-137 Source Strength: 2.33 mR/hr/mCi @ 1m

	RANGE	ACTUAL mR/hr	OBSERVED mR/hr
X	1	.25 .15	.25 .15
X	10	.5 1.5	.5 1.6
X	100	5 15	5.2 12.3
X			
X			

RECEIVED  
 APR 18 1986  
 Medical Center  
 Evansville Center

RANGE ANALYSIS

X <u>1</u>	Within ± 10%	Correction Factor <u>OK</u>
X <u>10</u>	Within ± 10%	Correction Factor <u>OK</u>
X <u>100</u>	Within ± 10%	Correction Factor <u>OK</u>
X _____	Within ± 10%	Correction Factor <u>1.1</u>
X _____	Within ± 10%	Correction Factor <u>1.2</u>
X _____	Within ± 10%	Correction Factor _____
X _____	Within ± 10%	Correction Factor _____

Battery Change: YES  NO

173.6 uCi Cs137 ck. at 20 cm = 15 mR/hr

Efficiency for N/A = \_\_\_\_\_

Remarks: \_\_\_\_\_

Next Calibration Date: January 1987 Calibrated by: [Signature]

TECH INC.  
 Centre Circle Drive  
 GROVE, ILLINOIS 60515  
 (2) 620-8750

# Packing List

2333

DATE SHIPPED 01/10/85	SHIPPED VIA UPS	OUR NO 21106	SALESPERSON
UNIVERSITY CELL CENTER FOR MED. ED. UNIVERSITY BLVD. ASVILLE IN 47712		SOLD TO:	
GEOGE P. GUTHRIE		812-464-1831	

QUANTITY	DESCRIPTION
1	SURVEY METER, GM MOD GSM-5 SN 1002

CARTONS 1	TOTAL WEIGHT 5 lbs	ORDER COMPLETE Yes	BALANCE TO FOLLOW No	PACKED BY S. NOVAK	CHECKED BY
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PLEASE NOTIFY US IMMEDIATELY IF ERROR IS FOUND IN SHIPMENT


Signature of person unpacking merchandise \_\_\_\_\_

Date merchandise unpacked \_\_\_\_\_

CERTIFICATION OF CALIBRATION - RADIATION SURVEY INSTRUMENTS

Calibration Date: March 28, 1989

Facility: University of Southern Indiana City: \_\_\_\_\_ State: \_\_\_\_\_

INSTRUMENT IDENTIFICATION

G-M     Ion Chamber     Pocket Dosimeter     Other: \_\_\_\_\_

Manufacturer: Win B. Johnson Model No.: GSM-5 Serial No.: 1002

Calibration Sources:

Cs-137 0.1573 mCi; Cs-137 \_\_\_\_\_ mCi; Co-57 \_\_\_\_\_ mCi; \_\_\_\_\_ mCi; All as of: 3/28/89 (date)

Window: \_\_\_\_\_ Open \_\_\_\_\_ Closed  Fixed

SCALE/RANGE	ACTUAL <sup>CPM</sup> mR/hr	OBSERVED <sup>CPM</sup> mR/hr	WITHIN +10%	CORRECTION FACTOR
X	100	100	✓	
	400	400	✓	
X   10	1000	1000	✓	
	4000	4000	✓	
X   100	10000	10000	✓	
	40000	40000	✓	
X				
X				
X				
X				

Angle of the flux field to detector (internal or external) is 90° (perpendicular) and the distance is from center of source to center of detector, unless stated otherwise. Sodium iodide front end detectors are calibrated parallel to the flux field.

Comments: \_\_\_\_\_

Battery Check: \_\_\_\_\_ (mR/hr) or OK Operational Check: \_\_\_\_\_ mR/hr using \_\_\_\_\_

Co-57 efficiency relative to Cs-137 = N/A%. 157.3 uCi Cs-137 check at 228 cm = 2400 <sup>CPM</sup> mR/hr

Next Calibration Date: 3/90 Calibrated By: Richard W Adams

SERVITSCH, INC.

1515 Brook Drive  
DOWNEY GROVE, ILLINOIS 60515  
(312) 570-5750

# Packing List

5749

CUSTOMER ORDER NO.	DATE SHIPPED	SHIPPED VIA	OUR NO.	SALESPERSON
	3-30-89	UPS	A 2905	

SHIP TO:	SOLD TO:
University of Southern Indiana 5600 University Blvd Evansville, IN 47712	

V	QUANTITY	DESCRIPTION
	1	JOHNSON SURVEY METER GSM-5 SN. 1002

CARTONS	TOTAL WEIGHT	ORDER COMPLETE	BALANCE TO F.O. LOW	PACKED BY	CHECKED BY
1	4.25			JC	

PLEASE NOTIFY US IMMEDIATELY  
IF ERROR IS FOUND IN SHIPMENT

X				
X				

Angle of the flux field to detector (internal or external) is 90° (perpendicular) and the distance is from center of source to center of detector, unless stated otherwise. Sodium iodide front end detectors are calibrated parallel to the flux field.

Comments: \_\_\_\_\_

Battery Check: \_\_\_\_\_ (mR/hr) or OK Operational Check: \_\_\_\_\_ mR/hr using \_\_\_\_\_

Co-57 efficiency relative to Cs-137 = N/A%. 157.3 uCi Cs-137 check at 228 cm = 2400  $\mu$ R

Next Calibration Date: 3/90 Calibrated By: Richard W Adams

**sahci** Consultants to Nuclear Medicine • Radiology • Nuclear Industry

PO# A0332

### Certification of Calibration - Radiation Survey Instruments

Calibration Date: 7 February 1990  
Facility: University of S. Indiana City: Evansville State: IN

#### INSTRUMENT IDENTIFICATION

G-M     Ion Chamber     Pocket Dosimeter     Other: \_\_\_\_\_

Manufacturer: W. Johnson    Model No.: GSM 5    Serial No.: 1002

Calibration Sources: Cs-137 0.153 mCi; Cs-137 72.05 mCi; Co-57 mCi: 0.525 mCi;  
All as of date: 2/7/90

Window: \_\_\_\_\_ Open  Closed \_\_\_\_\_ Fixed

SCALE/RANGE	ACTUAL mR/hr	OBSERVED mR/hr	WITHIN +/- 10%	CORRECTION FACTOR
X 1	0.05	0.05	✓	
	0.15	0.15	✓	
X 10	0.5	0.55	✓	
	1.5	1.5	✓	
X 100	5	5	✓	
	15	15	✓	
X				
X				
X				
X				

Angle of the flux field to detector (internal or external) is 90 degrees (perpendicular) and the distance is from center of source to center of detector, unless stated otherwise. Sodium iodide front end detectors are calibrated parallel to the flux field.

Comments: \_\_\_\_\_

Battery Check: 1.75 (mR/hr) or \_\_\_\_\_ Operational Check: \_\_\_\_\_ mR/hr using \_\_\_\_\_

Co-57 Efficiency Relative to Cs-137 = 180 %.

153 uCi Cs-137 check at 13.7 cm = 1.5 mR/hr.

Next Calibration Date: 2/91    Calibrated By: J. J. [Signature]

# Packing List

SAHCCI, INC.  
 1509 Brook Drive  
 DONNERS GROVE, ILLINOIS 60515  
 (708) 620-8750

7627

CUSTOMER ORDER NO. FOO123	DATE SHIPPED 02/08/90	SHIPPED VIA UPS	OUR NO. A2477	SALESPERSON
SHIP TO: UNIV. OF SOUTHERN INDIANA CENTER FOR MEDICAL EDUCATION 3600 UNIVERSITY BLVD EVANSVILLE IN 47712 DR. GEORGE D. GUTHRIE 812/464-1831		SOLD TO: UNIV. OF SOUTHERN INDIANA 3600 UNIVERSITY BLVD. EVANSVILLE IN 47712 PURCHASING DEPT. 812/464-1831		
V	QUANTITY	DESCRIPTION		
	1	JOHNSON SURVEY METER MOD GSM-5 SN 1002		
<i>Shipped UPS 2/8/90</i>				
CARTONS	TOTAL WEIGHT <i>6.6lb.</i>	ORDER COMPLETE	BALANCE TO FOLLOW	PACKED BY <i>TCM</i>
CHECKED BY				

PLEASE NOTIFY US IMMEDIATELY  
 IF ERROR IS FOUND IN SHIPMENT

X				
X				

Angle of the flux field to detector (internal or external) is 90 degrees (perpendicular) and the distance is from center of source to center of detector, unless stated otherwise. Sodium iodide front end detectors are calibrated parallel to the flux field.

Comments: \_\_\_\_\_

Battery Check: 1.75 (mR/hr) or \_\_\_\_\_ Operational Check: \_\_\_\_\_ mR/hr using \_\_\_\_\_

Co-57 Efficiency Relative to Cs-137 = 180 %.

153 uCi Cs-137 check at 13.7 cm = 1.5 mR/hr.

Next Calibration Date: 2/91 Calibrated By: JT [Signature]



Consultants to Nuclear Medicine • Radiology • Nuclear Industry

# CERTIFICATION OF CALIBRATION · GAMMA SURVEY INSTRUMENTS

Calibration Date: January 31, 1986  
 Facility: U. of Southern Indiana (Dept. for Medical) City/State: Evansville, IN  
 Instrument Identification: \_\_\_\_\_ Model No. GSM-5  
 G-M     Ion Chamber     Other \_\_\_\_\_  
 Manufacturer: Kim B Johnson Serial No. 2134  
 Calibration Source: \_\_\_\_\_ Source Strength: \_\_\_\_\_ mR/hr/mCi@1m  
 Radionuclide: \_\_\_\_\_

RANGE	ACTUAL mR/hr	OBSERVED mR/hr
X <u>1</u>	<u>0.05</u>	<u>0.05</u>
X <u>10</u>	<u>0.15</u>	<u>0.15</u>
X <u>100</u>	<u>0.5</u>	<u>0.5</u>
X _____	<u>1.5</u>	<u>1.6</u>
X _____	<u>5.0</u>	<u>5.5</u>
X _____	<u>15</u>	<u>14</u>
X _____		
X _____		

**RANGE ANALYSIS**  
 X 1    Within ± 10%  
 X 10    Within ± 10%  
 X 100    Within ± 10%  
 X \_\_\_\_\_    Within ± 10%  
 X \_\_\_\_\_    Within ± 10%

Correction Factor OK  
 Correction Factor OK  
 Correction Factor OK  
 Correction Factor OK  
 Correction Factor OK  
 Correction Factor \_\_\_\_\_  
 Correction Factor \_\_\_\_\_  
 Correction Factor \_\_\_\_\_

**RECEIVED**  
 FEB 6 1986  
 Medical Education  
 Evansville, Indiana

Battery Change: YES  NO   
173 uCi    Cs137 ck. at 20 cm = 155 mR/hr  
 Efficiency for <sup>57</sup>Co relative to <sup>137</sup>Co = 145%

Remarks: \_\_\_\_\_  
 Next Calibration Date: January 1987    Calibrated by: Mark J. Kapelush

sahci

STAN A. HUBER CONSULTANTS, INC.    □ 200 NORTH CEDAR ROAD    □ NEW LENOX, IL 60451  
 Consultants to Nuclear Medicine • Radiology • Nuclear Industry  
 (815) 485-6161



**SERVITECH INC.**  
 1409 Centre Circle Drive  
 COUNTRY GROVE, ILLINOIS 60515  
 (312) 520-9750

# Packing List

2395

CUSTOMER ORDER NO. 1978	DATE SHIPPED 12/13/86	SHIPPED VIA UPS	OUR NO. 41257	SALESPERSON
SHIP TO: UNIV. OF SOUTHERN INDIANA UNIV. OF SOUTHERN INDIANA 400 UNIVERSITY BLVD.		SOLD TO: UNIV. OF SOUTHERN INDIANA 400 UNIVERSITY BLVD.		
CITY/STATE/ZIP EVANSVILLE IN 47712		CITY/STATE/ZIP EVANSVILLE IN 47712		
P. GEORGE W. BURRITT 812/464-1831		PURCHASING DEPT. 812/464-1831		

QUANTITY	DESCRIPTION
1	SURVEY METER GM HQD 6891-S SN 2134

PARTS	TOTAL WEIGHT	ORDER COMPLETE	BALANCE TO FOLLOW	PACKED BY	CHECKED BY
1	6 lbs	YES	NO	SAOVAK	

thi PLEASE NOTIFY US IMMEDIATELY IF ERROR IS FOUND IN SHIPMENT =ac

X \_\_\_\_\_ Within ± 10%

Correction Factor \_\_\_\_\_  
 Correction Factor \_\_\_\_\_  
Medium Label at Evansville Center

Battery Change: YES  NO

173 uCi Cs137 ck. at 20 cm = 1.55 m/hr.

Efficiency for <sup>57</sup>Co relative to <sup>137</sup>Co = 145%

Remarks: \_\_\_\_\_

Next Calibration Date: January 1987 Calibrated by: Mark J. Kapelush

**sahci** Consultants to Nuclear Medicine • Radiology • Nuclear Industry

University of  
Southern Indiana

PURCHASE ORDER

No. 10197

PURCHASING DEPARTMENT  
8600 UNIVERSITY BOULEVARD  
EVANSVILLE, INDIANA 47712

REQUISITION

S  
H Dept. Medical Education - Guthrie  
I Bidg. Med Ed.  
P Room \_\_\_\_\_  
T Room \_\_\_\_\_  
O PURCHASE ORDER

Department No. 10197  
Date May 4, 1989

Name \_\_\_\_\_  
Street \_\_\_\_\_

City \_\_\_\_\_  
Check this department file copy against your requisition. Immediately report any discrepancies to purchasing department.

Authorized by \_\_\_\_\_  
Fiscal Agent \_\_\_\_\_

VENDOR ADDRESS

Supplier Servi Tech, Inc.  
Date 1509 Brook Drive  
Downers Grove, IL 60515  
Budget Account \_\_\_\_\_ to be charged \_\_\_\_\_

Delivery Required By \_\_\_\_\_ Terms N/30 F.O.B. Prepay & Add

ITEM NO.	QUANTITY	CATALOG NUMBER DESCRIPTION EDITION	UNIT PRICE	AMOUNT
1.	1	Calibrate Survey Meter <i>Model# GSM-5 SN 2134</i>		<u>\$65.00</u>
<p>RECEIVED MAY 8 1989 Medical Education Evansville Center</p>				
<p>CODES <u>4-45090-7110</u></p>				<u>\$65.00</u>

If shortages or damages are discovered upon receipt of shipment, please note such shortages or damages on your receiving report and ninth copy of purchase order (Buff Copy). Advise Purchasing by memorandum using name of vendor and purchase order number.

Comments \_\_\_\_\_  
APPROVED \_\_\_\_\_  
Purchasing Department  
INSTRUCTIONS: Forward to Purchasing Office. Give full description including quantity and unit intended use.  
APPROVED BY: State Board of Accounts  
IMPORTANT

# Certification of Calibration - Radiation Survey Instruments

A 7491

Calibration Date: 12 March 1990

Facility: Univ of S. Indiana City: Evansville State: IN

## INSTRUMENT IDENTIFICATION

G-M     Ion Chamber     Pocket Dosimeter     Other: \_\_\_\_\_

Manufacturer: WB Johnson Model No.: GSM 5 Serial No.: 2134

Calibration Sources: Cs-137 0.138 mCi; Cs-137 71.9 mCi; Co-57 mCi; 0.063

Window: \_\_\_\_\_ Open  Closed \_\_\_\_\_ Fixed \_\_\_\_\_ All as of date: \_\_\_\_\_

SCALE/RANGE	ACTUAL mR/hr	OBSERVED mR/hr	WITHIN +/- 10%	CORRECTION FACTOR
X 1	0.05	0.05	✓	
	0.15	0.15	✓	
X 10	0.5	0.5	✓	
	1.5	1.5	✓	
X 100	5	4.5		
	1.5	1.3		1.1
X				1.15
X				
X				
X				

Angle of the flux field to detector (internal or external) is 90 degrees (perpendicular) and the distance is from center of source to center of detector, unless stated otherwise. Sodium iodide front end detectors are calibrated parallel to the flux field.

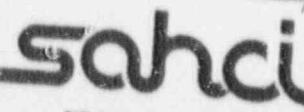
Comments: \_\_\_\_\_

Battery Check: \_\_\_\_\_ (mR/hr) or 400cpm Operational Check: \_\_\_\_\_ mR/hr using \_\_\_\_\_

Co-57 Efficiency Relative to Cs-137 = 170 %

158 uCi Cs-137 check at 18.6 cm = 1.5 mR/hr

Next Calibration Date: 3/91 Calibrated By: J. J. [Signature]



consultants to Nuclear Medicine • Radiology • Nuclear Industry

STAN A. HUBER CONSULTANTS, INC. 200 NORTH CEDAR ROAD

# Packing List

**SERVITECH, INC.**  
 1509 Brook Drive  
 DOWNERS GROVE, ILLINOIS 60515  
 (708) 620-8750

7683

ORDER NO 1638	DATE 03/13/90	SHIPPED VIA	OUR NO A7491	SALESPERSON
SHIP TO: UNIV. OF SOUTHERN INDIANA CENTER FOR MEDICAL EDUCATION 8600 UNIVERSITY BLVD EVANSVILLE IN 47712 R. GEORGE D. GUTHRIE 812/464-1831		SOLD TO: UNIV. OF SOUTHERN INDIANA 8600 UNIVERSITY BLVD. EVANSVILLE IN 47712 PURCHASING DEPT. 812/464-1831		

V	QUANTITY	DESCRIPTION
	1	EM, WM. B., JOHNSON SUR MOD G3MG SN 2134

CARTONS	TOTAL WEIGHT 6 LBS	ORDER COMPLETE	BALANCE TO FOLLOW	PACKED BY Tom	CHECKED BY
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PLEASE NOTIFY US IMMEDIATELY  
IF ERROR IS FOUND IN SHIPMENT

3-14-90


Signature of person unpacking merchandise \_\_\_\_\_  
 Date merchandise unpacked \_\_\_\_\_