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RULES FOR RADIOLOGICAL PROCEDURE

October 25, 1984

This Copy Assigned to:_

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RULES FOR RADIOLOGICAL PROCEDURE

1 Personnel Monitoring

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1.1 Each Employee Assigned to or Normally Working

- in a "Restricted Area" or potential "High Radiation Area"
- Having a probability of exposure greater than one quarter of the maximum permissable exposure.

on a production basis shall be issued a dosimeter and shall wear this dosimeter at all times when on the premises.

These dosimeters shall be read at least once a month.

In the event that a dosimeter is inadvertently left at home at the time of the quarterly reading, that person's immediate supervisor shall be informed and that person shall be informed and that person shall be issued a temporary dosimeter until his dosimeter is brought in and read, so that its reading can be attributed entirely to the preceding quarter.

3. All lost dosimeters shall be reported immediately so a new one can be issued. In this case, an exposure equal to the average of the previous three readings shall be assumed from the last reading date to the issuance of the new dosimeter.

162:R2

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- 4. Data reported by the outside service shall contain the employee's name, the period of exposure covered by the reading, the reading, and a running total of exposure for the calendar quarter and year.
- At the end of each quarter, the total exposure shall be transferred to a Form NRC-5 according to the rules thereon and those contained in Title 10, Part 20, of the Code of Federal Regulations (10CFR20).
- 6. The Form NRC-5 Data Sheets shall be kept in fireproof file cabinets located in the Radiation Safety Officer's office. The issuing, and reading of the dosimeters and the data recording shall be the responsibility of the Radiation Safety Officer (R.S.O.).

1.2 <u>Persons Not Normally Issued Dosimeters</u> - Each person hot normally issued a dosimeter shall upon entering the "High Radiation Area" be given a dosimeter and shall wear same during his entire stay in this area.

- Exposure measured by each dosimeter shall be recorded on a Form NRC-5 together with all other personal data required by this form.
- Each form containing the above data shall be turned over to the R.S.O.. These forms are to be added to the radiological records.

1.3 "Restricted Area" and "High Radiation Area" - "Restricted Area" and "High Radiation Area" are described in 10CFR20. At present, the following locations are "Restricted Areas" at VICTOREEN:

162:R3

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- <u>CALIBRATION DEPARTMENT</u> Located in the Northwest corner of the fourth floor. The Calibration and Repair Supervisor is responsible for this area.
- <u>COBALT-60</u> CALIBRATION FACILITY Located on the first floor. The Radiation Safety Officer is responsible for this area.
- 3. SOURCE STORAGE ROOM Located in the Northwest corner of the Warehouse (second floor). This room contains the Waste Drum, a locked cabinet for storage of sealed sources used in production, and a locked cabinet for storage of sealed source not used for production. This room also is used for the storage of containers of source in liquid form. The Radiation Safety Officer is responsible for this area. Access to the locked cabinet of production.
- 4. <u>SHIPPING/RECEIVING STORAGE ROOM</u> Located in the Northwest areas of the Quality Assurance Department. This room is used for the temporary storage of shipments containing radioactive materials. The Quality Assurance Supervisor is responsible for this area.
- 5. <u>RAD CELL ROOM</u> Located in the Northwest corner of the Shipping/Receiving Department (garage). This room contains the Model 770 Rad Cell. The R.S.O. is responsible for this area.
- <u>DOSIMETER CALIBRATION FACILITY</u> Located in the North of the first floor, adjacent to the Maintenance Department. The Calibration and Repair Supervisor is responsible for this area.

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-3-

1.4 "High Rediation Areas" - At present, the following locations are defined as "HIGH RADIATION AREAS" at VICTOREEN, INC.

162:R4

- CALIBRATION DEPARTMENT Labeled areas while calibrations are in progress
- COBALT-60 CALIBRATION FACILITY Labeled areas while calibrations are in progress.
- DOSIMETER CALIBRATION FACILITY Labeled areas while calibrations are in progress.

CURRENT LISTING OF SUPERVISOR NAMES ARE POSTED IN THE RADIATION SAFETY OFFICER'S OFFICE.

1.5 Personnel Using Sources of Ionizing Radiation - All personnel using sources of ionizing radiation shall be instructed in proper use of such materials or devices and in the hazards associated with excessive exposure to radiation. Such instruction shall include, but not be limited to, the required reading of 10CFR20, and 10CFR19, especially those sections pertaining to exposure limits, dosimetry records, availability of such records and regulations to the employee, and other responsibilities of the employer, and the required reading of these "Rules for Radiological Procedure". The responsibility of carrying out such instruction shall rest with the R.S.O. or personnel authorized by him.

Contemplated changes in personnel using sources of ionizing radiation shall be referred to the R.S.O. by the department head concerned, so that dosimetry records may be made out and dosimeters issued.

1.6 <u>Irregularities in Personnel Monitoring</u> - Any irregularities in personnel monitoring procedure shall be reported immediately to the R.S.O.

CONTROL NO. 7 82 2 3

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2 Radiation Surveys

2.1 <u>Survey Conducted of Each "Restricted Area"</u> - The R.S.O. shall have a survey conducted of each "Restricted Area" and source storage area with the appropriate survey meter before it is put into general use, for the purpose of establishing boundaries of "Radiation Area" and "High Radiation Areas" and maintaining proper radiation levels in "Uncontrolled Areas" as defined in 10CFR20.

Survey meter readings shall be written on a print of the floor plan of the particular area and these prints shall be filed with the radiological records.

2.2 <u>Additional Surveys</u> - Additional surveys are to be made when routines are changed to establish new boundaries of radiation areas and to maintain proper radiation levels in "Uncontrolled Areas."

2.3 <u>R.S.O. Shall Have Wipe Test Surveys</u> - The R.S.O. shall have Wipe test surveys conducted in all areas associated with the preparation or use of unsealed radioactive material for the production of sealed sources. These surveys shall be scheduled to provide the earliest possible detection and control of contamination. To assure adequate scheduling, it shall be the duty of all cognizant supervisory personnel to inform the R.S.O. of contemplated preparation activities, production runs, etc.

Leak Testing of Sources

3.1 <u>R.S.O. To Have Source Checks</u> - The R.S.O. shall have all sources used for calibration which are permanently located at VICTOREEN leak checked at intervals not to exceed six months according to Paragraph F.

3.2 Leak Test - All specifically licenseable or radium sources which are installed in instruments for sale shall be leak tested when placed into instruments by Instrument Assembly Department personnel. Records of these tests shall be kept in Instrument Assembly Department and on a Wipe Test decal placed on each instrument.

CONTROL NO. 3 82 2 9

3.3 <u>Major Calibration Sources Leak Tested</u> - The R.S.O. shall have major calibration sources leak tested and the data filed with the radiological records. A Leak Test report shall be made out and accompany the device to the customer.

3.4 <u>Sources Showing Leaking</u> - Sources showing leaking in excess of 0.005 microcuries shall be placed in sealed containers and returned to the vendor, or put in the Rad-Waste Drum to be disposed of through VICTOREEN's disposal agent.

3.5 <u>Vendor Leak Tests</u> - Vendor leak tests of all incoming sources shall be given to the R.S.O. for filing with the radiological records.

3.6 Leak Testing Methods - The following Leak Test procedures shall be accomplished using a combination of radiation detector (i.e., end window GM tube, scintillation crystal, etc.) and associated circuitry whose sensitivity to 0.005 uc of the isotope being tested has been demonstrated to be at least ten times residual background to the satisfaction of the Radiation Safety Officer.

- Sr90 Wipe Tests Cotton swab moistened with H20 wiped over face of source.
- Rad Cell Co60 Source Filter paper moistened with acetone and fastened to outside surface of sample container inside the Model 770 Rad Cell to wipe the inside surface of the Rad Cell.
- 3. "Small" and "Large" Co60 and Cs137 Sources in Radio-Isotope Calibration Lead Storage Container -Cotton swab moistened with acetone wiped over exposed joint in end of source holder with source in "down" position.
- Csl37 Source in Dosimeter Test Jig Container Cotton swab moistened with acetone wiped over source with source in "up" position.
- 5. Co60 Teletherapy Unit in Co60 Facility Cotton swab moistened with alcohol or acetone wiped over seam of source retaining plate and top surface of source rotation gear.

4 Area Security and Posting

162:R7

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4.1 <u>Posting Radiation Signs</u> - Radiation Areas and Radioactive Material signs shall be posted according to the requirements of Part 20.203 of Federal Register Title 10, Part 20. Specifically, the following postings shall be maintained:

- "Radiation Area" Signs At door of warehouse room containing source storage cabinet.
- "High Radiation Area" Signs (a) Required in Calibration Department on door to the Sources range. (b) In the Co⁶⁰ Facility at the doors leading to the radiation rooms. (c) On wall leading to Dosimeter Calibration Jig in the Dosimeter Calibration Facility.
- 3. "Radioactive Material" Signs (a) At entrances to Calibration Department Rad Cell Room, Q.A. Department source storage room, and Warehouse Room. (b) Radioactive source containers in Calibration Department, Q.A. Department, Rad Cell Room, and Co⁶⁰ Facility. (c) Source storage cabinets in each Department which has been issued sources for production and R & D use.

4.2 <u>Copies of Form NRC-3</u> - Copies of Form NRC-3 shall be posted at locations observable by all radiation workers. Ohio Department of Health "Notice to Employees" and "Acknowledgement of Registration" shall be posted in the Calibration Department and Co⁶⁰ Facility. Licenses, regulations and operating procedures are available from the Radiation Safety Officer.

4.3 <u>Emergency Procedure</u> - Emergency Procedure signs shall be posted at the entrance and inside the "High Radiation Areas". These signs shall contain the following information:

CONTROL NO. 1 82,29

EMERGENCY PROCEDURE

IN CASE OF FIRE, EXPLOSION, OR OTHER INCIDENT involving the radioactive sources labelled "RADIOACTIVE MATERIAL" in this area, immediately call at least one of the following:

- 1. Radiation Safety Officer, Stanley Kawecki, Ext. 277 (home: 521-8051)
- 2. Maintenance Chief, John Koning, Ext. 266 (home: 941-2584)
- 3. Q.A. Engineer, George Kawasaki, Ext. 323 (home: 681-7659)

The radioactive material containers are fireproof. Do not attempt to open, operate, or demolish them.

IN CASE OF SUSPECTED OR KNOWN OVER-EXPOSURE TO RADIATION, the person(s) contacted above will arrange to:

- 1. Call the Cleveland Clinic Emergency Desk (444-6749) and tell them:
 - (a) That a possible radiation over-exposure victim is on the way.
 - (b) To alert their "Radiation Response Team".
- 2. Immediately have the victim driven to the emergency room of Cleveland Clinic Hospital, located at the "Ambulance Entrance", on the east side of E. 90th Street, between Euclid and Carnegie Avenue.

Information required upon arrival will be:

- (a) Is the exposure internal or external?
- (b) Possibility of external contamination on victim.
- (c) Victim's name, social security number, and medical insurance coverage.
- 3. Have the victim's dosimeter read out and recorded.
- Reconstruct the incident (while en route to the hospital, if necessary).
- 5. Estimate the extent of the exposure, based upon the dosimeter reading and reconstruction of incident, and inform the hospital of the results as soon as possible.

Inform the Nuclear Regulatory Commission of the incident according to procedures and within the time frame prescribed in the NRC Rules and Regulations, 10CFR20.402, 20.403, and 20.405, depending upon the severity of the incident.

-8-

4.4 Security

162:R9

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- All radioactive materials, except those mounted in instruments, shall be stored in the assigned, locked cabinets or areas during off hours or whenever persons responsible for them are not present.
- 2. Calibration sources in the Calibration Department and Co^{60} Facility shall not be left in the "up" or irradiation position unless qualified personnel are in continuous attendance.
- Calibration Department shall be locked during off hours and three keys shall be issued. These shall be in the custody of:
 - . Calibration Department Head
 - . Maintenance Department Head
 - . Radiation Safety Officer
- 4. The Rad Cell Room shall be locked at all times when not in use. Two keys shall exist, in the custody of the Radiation Safety Officer, and the Maintenance Department Head.
- Co60 Facility shall be locked when not in use and two keys shall be issued. These shall be in the custody of:

Co60 Facility Head Radiation Safety Officer

- Use of calibration sources in Calibration Department shall be limited to persons specified by Calibration Department Head and Radiation Safety Officer. Each person shall be instructed per Section IE above.
- Use of calibration sources in Co60 Facility shall be limited to the Radiation Safety Officer and persons specified by him. Each person shall be instructed per Section IE above.
- Operating Procedures for calibration sources in the Co60 and Calibration Department shall be posted near the control panels.

- Source storage area in warehouse area shall be kept locked at all times. Two keys shall exist, in the custody of:
 - . Stockroom Supervisor
 - . Radiation Safety Officer
- Source storage room in Q.A. Department shall be kept locked during off hours. Two keys shall be issued. These shall be in the custody of:
 - . Manager Q.A. Dept.
 - . Radiation Safety Officer
- 11. All sources stored in cabinets in unrestricted area shall sufficiently shielded that radiation levels one foot from cabinet surfaces do not exceed 2 mR/h.

5 <u>Source Inventory</u> - The R.S.O. shall keep an up-to-date inventory of all sources used for instrument calibration and R & D efforts, and all of sources and radioactive material incorporated into production instruments or components. This will be accomplished as follows:

- 1. The R.S.O. shall be informed of all incoming radioactive material.
 - . by the Receiving Department
 - by Repair and Calibration in the case of incoming repairs
- 2. The R.S.O. will immediately enter these in his log.

SUPERVISORS AND PRIMARY USERS OF RADIOACTIVE MATERIALS

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162:R11

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Area	Supervisor	Primary User
Repair & Calibration	Connie Benham	N/A
Cobalt - 60 Facility	Stanley Kawecki	William Simon
Source Storage Room	Stanley Kawecki	Barbara Kapsar
Shipping/Receiving (QA)	Roger Zimmerman	Carl Moore
Rad Cell Room	Stanley Kawecki	Barbara Kapsar
Dosimeter Calibration	Connie Benham	N/A

J.

RADIATION SAFETY COMMITTEE

The Radiation Safety Committee is designed to bring the broad experiences of the staff to bear on the safe utilization of radioactive materials. The Committee consists of two certified Health Physicists, the Radiation Safety Officer, and the Assistant RSO (a former RSO).

The Committee meets regularly in review of the Radiation Program, setting general guidelines to be followed by the RSO, personnel using Radioactive materials, and Managers in planning for such usage.

The members of the Radiation Safety Committee are:

Stanley J. Kawecki - Radiation Safety Officer
Barbara M. Kapsar - Assistant Radiation Safety Officer
Morgan Cox - Certified Health Physicist, Manager of Field Sales
Arthur C. Lucas - Certified Health Physicist, Chairman of Committee
Vice President; Director of R & D

Resume for Mr. Cox is attached. Resumes for the remaining are submitted in Item 6c, 16 and 17.

F. MORGAN COX

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EXPERIENCE	
1984 to Present	Certified Health Physicist, Manager, Market Planning and Development, Victoreen, Inc., Cleveland, Ohio.
1967 - 1984	Marketing Manager 1975-1984; Marketing Engineer 1973-1975; Product Manager, Health Physics Products, The Harshaw Chemical Company, Crystal & Electronics Products Department, Solon, Ohio.
1965 - 1967	Lead Nuclear Safety Engineer, Westinghouse Astronuclear Laboratory, Nuclear Rocket Development Station (NTS, Nevada).
1963 - 1965 •	Health Physicist, Westinghouse Astronuclear Laboratory, Large, PA.
1962 - 1963	Visiting Staff Member, Field Studies Group H-8, Los Alamos Scientific Laboratory, Los Alamos, New Mexico and Mercury, Nevada.
1958 - 1962	Health Physics Engineer, Westinghouse Atomic Power Department, Westinghouse Testing Reactor, Waltz Mill, PA.
1958	Health Physicist, Brookhaven National Laboratory, Upton, Long Island, NY.
1957	Engineer, U.S. Army Corps of Engineers, Forest City, Pennsylvania.
PROFESSIONAL ACTIVITIES	Certified Health Physicist; Member, Health Physics Society; Member AAPM: Member, A.I.H.A.; Member, Radiation Research Society; Member, 4 Local Chapters of HPS and ANS; Admissions Liaison Officer, U.S. Military at West Point.
PUBLICATIONS:	Author of more than 15 published technical articles and reports in the fields of TLD, operational health physics, radiation dosimetry and nuclear radiation detection. Principal subjects nuclear reactor health physics, dosimetry and dose rate measurements.
PATENTS:	Coholder of several patents related to radiation dosimetry.
EDUCATION:	B.S., University of Scranton M.S., University of Rochester

CONTROL NO. 782 29

MAINTENANCE OF PICKER COBALT-60 TELETHERAPY UNIT

VICTOREEN, INC. will contract with an outside service company to perform inspection and servicing on the Cobalt-60 unit.

VICTOREEN, INC. has contacted Adam Therapy, Cleveland, Ohio on providing this service. Inspection and standard maintenance can be performed with the unit mounted in the proposed position.

VICTOREEN, INC. will have this service performed after installation in order to insure proper operation.

A copy of the last maintenance performed (July 22, 1980) is attached.



	D.R.S. NO. H
TELETHERAPY UN	ECTION & PREVENTATIVE MAINTENANCE REPORT - Page 1 of 3
	· · · ·
CUSTOMER:	VICTOREEN INC. 10101 Woodland Ave, Cleveland OH44104
P.M.P. OFFICE	(Hosp. or Doctor) (Location)
TYPE OF UNIT:	Cat. No. 6096-B C/5000 Head 581-A Ser. No. 155
DATE OF INSPEC	CTION: 7/22/80 Lic. Engineer T. Kidd
The following	items have been inspected and the listed action taken or
the source he	as indicated. None of the recommended items require that
ine source be	removed for their correction.
I SOURCE	HEAD
Α.	Check for significant radioactive contamination
	() None detected
B	() See report on reverse side Shutter rotar bearings
	1. Inboard 2. Outboard
	() Lubricated () Lubricated
	(A Replaced A Replaced
с.	Shutter Rotor
	(V Cleaned
D	() Other - see reverse side Shutter Roter Cavity
υ.	(1) Cleaned
	() Other - see reverse side
Ε.	Shutter rotor return spring
	() Replaced
	(Y Other - see reverse side Judnit and a
۴.	Shutter Rotor Stops
	"OFF" Position (-) OK (-) Adjusted (-) Replaced
G.	Shutter Rator Drive Mechanism
	(/ Lubricated
	() Other - see reverse side
н.	Head Leakage Survey (13 points at 1 meter from source)
	Average Leakage 0,50 mrhm
	Highest Point Reading <u>3.0</u> mmhm

11

A. General condition: of the # 3312 carforter

PG439N

FIVE YEAR INSPECTION AND PREVENTATIVE MAINTENANCE REPORT - Page 2 of 3



MIROL NO. 7822

FIVE YEAR INSPECTION AND PREVENTATIVE MAINTENANCE REPORT - Page 3 of 3

E. General Safety

(C) Unit is safe to operate, however, whether or not the unit is accurate enough for treatment purposes is a determination which must be made by the Radiotherapist.

() Unit UNSAFE to operate or treat - see below for recommendations.

DATE INSPECTION COMPLETED	7-23	- 8	0	
By PICKER CORPORATION LICENSED	ENGINEER	7.	Kild	

REPORT EXPLAINED TO AND COPY RECEIVED BY 5 12

SERVICE/REPA	IR ORDER	
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CONTROL NO.

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... a.1.a.

ADVANCED MEDICAL SYSTEMS, INC. 1020 LONDON MOAD CLEVELAND, OHIO 44110

QUANTITY	PART NUMBER OR DESCRIPTION	PRICE	EA. 1	OTAL	(216) 892-3268	No.	0076
				+	NAME VICTOREEN INC		7-22-80 .
					STREET 10101 Woodland Avenue		
	·			+	CITY & STATE Cleveland Ohio 44104		PHONE
	· .			-	SERIAL	NUMBER	
					LIST BELOW WORK TO BE DONE		PRICE
					Chang Source AMS 2377		
				+	Proton to mint		
					Juganta Syr. Mantaan	ne	
					Service Houd to yoke.		
					-		
				-			
				+	I HEREBY AUTHORIZE THE ABOVE REPAIR WORK TO BE DONE TOTAL LAN	BOR	
				-	TOTAL AC	CESSORIES	
				1	-		
THER ITEN	Ch.				-		
					AUTHORIZED AND CONDITIONS AGREED TO AS STATED ABOVE	BLET REPAIRS	
					5. Rauger TOTAL PRI	OR TO TAX	
				+	RECEIVED BY SALES TAX	*	
					TOTAL	AMOUNT	

DELIVERY SHEET

PICKER CORP., ISOTOPE OPERATION, CLEVE., OHIO

RADIATION SURVEY FOR CAT. 581 AND 581A

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• • •	•					•	
POSITION NO.	SURFACE TO ONE METER	METER READINGS	CORRECTED	•	· · · ·	0	
1	. 71.0cm	_0.6	0.14	mr/hr	2	Th	8
2	.71.0	-0.7	0.72	• • •		Λ	1
3	72.0	0.6	0.64		3 -	\rightarrow	+0
-4	70.0	0.2	0.24	•		$V \square$	
5	17.0	3.0	B.3.00	*		TH	6
6	70.0	0.2	0.24		· · · · · ·		
7	72.0	0.4	0.45				
8	71.0	0.4	0.45		•	6	
9	71.0		1.10	•	. @	FRONT	9
10	_70.5	_1.8	1.78			$X \mid \rangle$	K :
. 11	64.0	0.3	0.35	•	(B) -	11/	(ič
12	_70.0	0.2	0.24		0		
13	72.0	. 0.7	0.72		0	$ \Rightarrow $	K
14	71.0	0.6	0.64	••	(2)		U.
15	72.0	0.4	0.45	· · · .		SIDE	•
16	72.0	1.4	1.39				
17	72.0	1.1	1.10	•			(P)
18	72.0	0.3 6	0.35	mr/hr at	one	XD	X
10	TAL OF 18 REA	DINGS	14.50	meter fro	m source	Δ	
AVERA	GE OF 18 REA	DINGS	0.806		· · ·	$\langle \rangle$	
Custon Head I	Serial No. 5 ument Used	en Inc 81-A 155	14 157		2.0	TOP	
Source	e 6.11. 2877 Di y linde By	a. 2.0 RHA	1921 RHEAT	Date 7/21/8	• •		
Date :	Survey Made	7/22/80				· . · · · · ·	
			· · · · · ·				

Advanced Medical Systems, Inc.



1020 London Road Cleveland, OH 44110 (216) 692-3268

7/22/80

Victoreen Inc 10101 Woodland Ave Cleveland Oh 44104

CERTIFICATE OF MEASUREMENT COBALT-60 SOURCES CATALOG NO. SERIAL NO.

This is to certify that the radioisotope source as identified above was measured at the ADVANCED MEDICAL SYSTEMS, INC., 1020 London Road in Cleveland, Ohio, U.S.A., in such a fashion that the measurement is equivalent to that obtained when the source is installed in Picker Catalog Number 6096-B 60-Cobalt Beam Therapy Treatment equipment with Catalog No. 3347 beam defining device of 20cm X 20cm aperture at a distance of 80cm.

Under these conditions this source was found to have a radiation output in free air of 1921 roentgens per hour at one meter on <u>July 21st</u> 1980 .

The attached decay table for this radioisotope will be useful in estimating the activity at future dates.

This source will contain 2005 curies on August 1st, 1980.

Harquente lem Signed: Morguerite Ames

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Date:

The measurement reported is for invoicing purposes only and A.M.S., Inc. assumes no responsibility for results of exposures computed with this value.

CONTROL NO. 78223

7/22/80

Advanced Medical Systems, Inc.



1020 London Road Cleveland, OH 44110 (216) 692-3268

7-22-80

Victoreen Inc 10101 Woodland Ave Cleveland Oh 44:04

Gentlemen:

Received from			VICTOREEN INC	85	of	
2 2 July 1980		1980	, one	60-Cobalt	teletherapy	BOUTCE
Serial	No.	PX-12			······································	bource,

ADVANCED MEDICAL SYSTEMS, INC. is authorized to receive the above mentioned source under N.R.C. License No. 34-19089-01.

Very truly yours,

ADVANCED MEDICAL SYSTEMS, INC. 1020 London Road Cleveland, Ohio 44110

Jarqueite leme

Marguerite Ames Office Manager

·Advanced Medical Systems, Inc.



1020 London Road Cleveland, OH 44110 (216) 692-3268

7/22/80

Victoreen Inc 10101 Woodland Ave Cleveland Oh 44104

CERTIFICATE OF WIPE TESTING OF RADIOISOTOPE SOURCE

This is to certify that the radioisotope source identified as ADVANCED MEDICAL SYSTEMS, INC., Catalog No. AMS-3802, Serial No. AMS-2377 Cobalt-60 Therapy Source and to be installed in Picker Model No. 581-A, Serial No. 155 Therapy Unit, was wipe tested on 18th July 1980 and found to have .00098 microcurie of removable contamination, as determined by comparison of the wipe with a standard Cobalt-60 source of .1060 microcurie in a Picker Model 2804 Welltype Scintillation Detector and a Picker Model 628433 Spectroscaler.

Harqueite leme Signed: Moquerite Ames

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Dated: 7/22/80

Advanced Medical Systems, Inc. 1020 London Road Cleveland, OH 44110 (216) 692-3268

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COBALT-60 DECAY TABLE

HALF LIFE: 5.26 ± 0.01 YEARS

OUTPUT = CALIBRATED OUTPUT X DECAY FACTOR

MONTHLY DECAY FACTOR	= 0.98905
QUARTERLY DECAY FACTOR	= 0.96755
SEMIANNUAL DECAY FACTOR	= 0.93625
ANNUAL DECAY FACTOR	= 0.87651

DECAY TABLE BY MONTHS

	0	1	2	3	4	5	6	7	8	9
0	1.0000	.9891	.9783	.9676	.9570	.9466	.9363	.9260	.9159	.9059
10	.8960	.8862	.8765	.8669	.8575	.8481	.8389	.8297	.8207	.8117
20	.8028	.7941	.7854	.7768	.7684	.7600	.7516	.7434	.7353	.7273
30	.7194	.7115	.7037	.6960	.6884	.6809	.6735	.6661	.6588	.6516
40	.6446	.6375	.6305	.6236	.6168	.6101	.6034	.5968	.5903	.5839
50	.5775	.5712	.5650	.5588	.5527	.5466	.5407	.5348	.5289	.5231
60	.5174	.5118	.5062	.5007	.4952	.4898	.4845	.4792	.4739	.4687
70	4636	4586	.4536	.4486	.4437	.4388	.4340	.4293	.4246	.4200
80	.4154	.4109	.4064	.4020	.3976	.3932	.3889	.3847	.3805	.3763
00	3722	3681	.3641	.3602	.3562	.3523	.3485	.3447	.3409	.3372
100	3335	3299	3262	.3227	.3192	.3157	.3122	.3088	.3055	.3021
110	.2988	.2956	.2923	.2892	.2860	.2829	.2798	.2767	.2737	.2707
120	.2678									

Advanced Medical Systems, Inc. 1020 London Road Cieveland, OH 44110 (216) 692-3268



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COBALT-60 DECAY TABLE

HALF LIFE: 5.26 ± 0.01 YEARS

OUTPUT - CALIBRATED OUTPUT X DECAY FACTOR

MONTHLY DECAY FACTOR	= 0.98905
QUARTERLY DECAY FACTOR	= 0.96755
SEMIANNUAL DECAY FACTOR	= 0.93625
ANNUAL DECAY FACTOR	= 0.87651

DECAY TABLE BY MONTHS

	0	1	2	3	4	5	6	7	8	9
•	1 0000		9783	.9676	.9570	.9466	.9363	.9260	.9159	.9059
10	8960	8862	.8765	.8669	.8575	.8481	.8389	.8297	.8207	.8117
20	8028	7941	.7854	.7768	.7684	.7600	.7516	.7434	.7353	.7273
30	7194	.7115	.7037	.6960	.6884	.6809	.6735	.6661	.6588	.6516
40	6446	6375	.6305	.6236	.6168	.6101	.6034	.5968	.5903	.5839
50	5775	5712	.5650	.5588	.5527	.5466	.5407	.5348	.5289	.5231
40	5174	5118	.5062	.5007	.4952	.4898	.4845	.4792	.4739	.4687
70	4636	4586	4536	.4486	.4437	.4388	.4340	.4293	.4246	.4200
-	4154	4109	4064	.4020	.3976	.3932	.3889	.3847	.3805	.3763
00	3722	3681	3641	.3602	.3562	.3523	.3485	.3447	.3409	.3372
100	2225	9200	3262	3227	.3192	.3157	.3122	.3088	.3055	.3021
110	.2988	.2956	.2923	.2892	.2860	.2829	.2798	.2767	.2737	.2707
120	.2678									

